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ARDEN RECEIPTS

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EDITED BY

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PREFACE.

EVERY ONE familiar with a garden knows that one of the chief cares therein is combating the various insects and other pests that infest it. Without clear knowledge and continued attention in this way much of the labour and expense devoted to the garden will be thrown away. The object of this book is the collection, in a handy form, of information on this and other topics embraced under the general heading of "Garden Receipts." Great pains have been taken to make the collection of Receipts, &c., as complete as possible. A great variety being given for one purpose, is justified by the fact that one remedy easily applied in a given district may be too expensive in another; and by the extreme difficulty of getting rid of many of the pests alluded to in these pages. The Glossary of the materials used is made a special feature, and is as complete as possible. Although the arrangement of both the Receipts and Glossary is alphabetical, a copious Index has been added to facilitate reference.

GARDEN RECEIPTS.

American Blight.

THE AMERICAN BLIGHT (Aphis lanigera or Eriosoma Mali) is most destructive to Apple trees, breeds fast, and spreads with great rapidity. In the garden or orchard, where it makes its appearance on a single tree, if left unmolested, it will soon be found in quantity on the surrounding trees, even at a considerable distance. It establishes itself in any crack or inequality in the bark, and breeds in quantity, giving the trees for a portion of the year the appearance of being partially coated with cotton-wool. Like most other insects that attack the bark of plants, the injury it effects is not so soon apparent as in the case of such insects as confine their depredations almost exclusively to the leaves. It causes unsightly protuberances on the bark, and ultimately reduces the trees which it attacks to a stunted, unhealthy condition. It is difficult to completely eradicate it, its destruction being well-nigh impossible when it once gets established in large orchards. The amount of labour it would require to eradicate it when it attacks large trees would preclude the possibility of attempting the experiment, but in moderate-sized gardens where the trees are small, it can be destroyed, especially if there be no delay in taking means for its destruction as soon as its presence is discovered.

Brushing.—This has often proved a remedy if applied early. Provide a small flat brush, shaped like a diamond, and measuring about 5 in. in length by 2 in. in width; with this brush scrub all infected parts, and the bugs will disappear. Unquestionably, some which lie more immediately under the rough bark may subsequently show themselves, but, if the new enemies be attacked as often as they display their downy bed on espaliers and dwarf standards, they will give no further trouble. A small brush, called a spoke brush, may also be used with advantage where access to the insect is difficult from the range of the branches.

Gas Liquor.—Mr. Baines has used the ammoniacal liquor from the gas-works with great success. He says:—"Some years ago Woolly Aphis made its appearance on half-a-dozen trained Apple trees at one corner of the garden. One of these was of an inferior kind, consequently I determined to experiment upon it. First, I procured from the gas-works some ammoniacal liquid; one-half of the tree I painted over with the liquor (full strength), the other half with it diluted with water to the extent of one-half. The application was made as soon as the leaves had fallen in autumn. The destruction of the insects was complete, as also the tree on the side dressed with the liquor in its undiluted state: the other side painted over with the liquor diluted was not injured in the least; nevertheless, I would advise any one using this remedy not to use the liquor in a stronger state than one-third to two-thirds water, for although on several subsequent occasions I used it at the strength of half water with the most effectual result, and without injury to the trees, yet I believe that the liquor obtainable in some places is much stronger than in others."

Goose-grease and Sulphur.—Mix goose-grease and flowers of sulphur together, in the proportion of 8 oz. of the former to 2 oz. of the latter, and apply with a paint-brush.

Lime.—Take ½ peck of quicklime, ½ lb. of flowers of sulphur, and ¼ lb. of lamp-black. Mix with boiling water, so as to form a thick paint; with this, in winter, when the leaves are off, paint the branches, having first removed all loose bark. Remove the soil from the bottom of the stem to the main roots, and paint the roots as far as they are exposed. The paint should be warm when used. When it has become dry, the trees should be looked over, and all cracks and holes stopped with well-worked clay. After frost, the clay stoppings should be dressed again, to close any cracks that may occur. In France, Apple trees suffering from American Blight are treated in the following manner:—The earth is removed from about the roots, on which a quantity of slaked lime is deposited; after this the earth is replaced. The remedy is said to be quite successful.

Oil.—In the case of trees in pots, Mr. D. S. Gillett, of the Court Gardens, Great Marlow, recommends that they should be thoroughly painted over with ordinary linseed oil, the operation to be repeated if necessary. Train oil and other fresh oils have been used with success, but in applying these care should be taken not to touch the buds. Coal-tar, naphtha, paraffin oil, and petroleum, laid on with a paint-brush have been used with good effect. Paraffin oil and petroleum may be safely used upon hard wood, but not upon wood that is green and tender.

Soda and Turpentine.—Dissolve 1 lb. of soda in a gallon of rain-water; shake this up in a vessel with a pint of spirits of turpentine until they amalgamate; add more water to make the quantity up to 10 gallons. Apply to the trees with a garden-engine or syringe having a fine rose.

Soft Soap.—M. Charles Joly, the Vice-President of the Central Horticultural Society of France, gives the following remedy for eradicating this troublesome pest:—To 7 lbs. of soft soap add 1 lb. of train oil, two or three handfuls of soot, and flowers of sulphur are to be mixed with a pailful of lime-water. When thoroughly incorporated throw in sufficient powdered clay to make the mixture of the consistency of butter. Spread a cloth beneath the affected tree, and scrape off all the Moss and bark which seem to be attacked by the Aphis, taking care to trim the rough portions of the bark and to clear out the crevices. Remove the cloth and burn everything that has fallen on it, and paint the whole of the trunk of the tree and the lower branches with the soap mixture, giving an extra dose to all crevices and cracks. Autumn is the best time for the operation, as the winter rains wash the soap mixture off the tree down to the roots, amongst which a few of the Aphides that escaped the soap mixture may have taken refuge. It cannot be too frequently repeated that the Woolly Aphis always takes up its winter quarters round the collar of the root, a fact that is too frequently lost sight of.

Ants.

The following methods of destroying these troublesome pests have been gathered from various sources:—

Alum Water.—Take 2 lbs. of alum and dissolve it in three or four quarts of boiling water, letting it stand on the fire until the alum is all dissolved; then apply it with a brush while nearly boiling hot to every joint and crevice in closets, pantry shelves, and the like. Brush the crevices in the floor of the skirting or mop-boards if there be any suspicion that they harbour ants.

Bones.—An effectual way of destroying ants in places where boiling water cannot be used is to lay half-picked bones about. These will soon be covered with ants, and can then be thrown into a vessel of boiling water, after which they should be again laid down to attract a fresh batch of victims. By persisting in the use of this trap a house will be completely cleared of ants in a short time; the sooner, of course, in proportion to the number of bones employed.

Camphor.—If the ants have formed their nest at the root of a plant, pour upon them a quart or so of warm water, in which a piece of camphor, the size of a Hazel Nut, has been steeped. This thoroughly destroys them, and is not in the least injurious to the plant. Camphor placed wherever table linen is kept is said to drive away ants most effectually.

Carbolic acid.—Some years ago, says a correspondent in the "Times," at my house in the country a colony of ants established themselves under the kitchen flooring. Not knowing the exact locality of the nest, I endeavoured to destroy the insects with treacle, sugar, arsenic, &c., but although I slew numbers thus the plague still increased. At last, bethinking myself that ants dislike the smell of tar, I procured some carbolic acid, and diluting it with about a dozen times its weight of water, I squirted a pint of mixture through the air-bricks under the flooring, and my enemies vanished that day never to return. It has always been successful.

Carbolic Soap, Brook's Liquid.—Mix a very small thumb-potful of this liquid with a gallon of water, and sprinkle the ants with it. It kills them instantly; it mixes with the water at once without any trouble.

Chalk.—To prevent ants from climbing trees scrape the bark in a ring about 2 in. wide around the tree; then take a piece of chalk and rub it on the ring all round till no green bark can be seen. The moment the ants' feet touch the chalk it offers no solid footing, and they fall back, not one being able to ascend. A chalk mark, at least half an inch in breadth, around the upper edge of sugar barrels, boxes, &c., will not admit one ant into the interior. The same mark drawn on the edges of shelves will also prevent the approach of an ant. The chalk mark must, of course, be perfectly continuous.

Flower-pot Trap.—Suppose a colony of ants to be commencing operations on a lawn, it is an easy matter to trap them all by placing a large empty flower-pot, with the hole stopped, over it. The ants will build up into the pot, and in a short time it may be lifted with a shovel and carried away and dropped into a vessel of water, which will make an end of them.

Flowers of Sulphur.—Flowers of sulphur are very useful in checking ants where boiling water cannot be used.

Gas Tar.—When ants make a run up the stem of a fruit tree, a line of gas tar all round will put a stop to their progress, and do no harm to the tree.

Guano.—It is not generally known that fresh Peruvian guano will drive ants from any spot, however firm a hold they may have obtained on it.

Mortar.—Make a mortar bed of their nest, stirring the ants in with the mud until their nest becomes a mass of mortar, which may then be removed.

Oil of Vitriol.—Kitchens and rooms on the ground floor may be cleared of ants by carefully pouring some strong oil of vitriol (sulphuric acid) down each of the holes. The dose will prove fatal not only to the living insects, but also to all their eggs.

Osier-bark Steep.—M. Colin Lebert, of Blois, has found that water in which the bark and parings of the Osier have been soaked, will remove ants. On one occasion, he says, perceiving a young tree which was infested with ants, I sprinkled it with Osier steep, and, to my surprise, the ants fell off as if immediately dead. The result so struck me that I determined to again try the effect on a nest; this time I was sure of the instantaneous effect, and I concluded this water was certain death to them. I have also proved that it is in no ways injurious to the plants; on the contrary, when once freed from ants, they thrive with greater vigour than before. The Osier steep forms, therefore, a simple and effective means of getting rid of these little depredators.

Petroleum.—Pouring a little petroleum upon their nest every few days will effectually kill or banish ants. Paraffin oil, benzoline, and kerosene are also very effective.

Putty.—Mr. E. Whitehead, of Blackburn, strongly recommends putty as a cure for ants. His plan is to put five or six lumps of putty in different parts of the house, when they almost immediately become covered with these little pests. He then takes another piece of putty about the size of a teacup, in a rather soft state, and dabs it on the lumps previously laid down, a plan by which thousands may be trapped in a few minutes.

Quassia.—The following mixture has been found successful:—Four ounces of quassia chips, boiled for ten minutes in a gallon of water, dissolving in the liquid while cooling 4 oz. of soft soap.

Quicklime.—Perhaps as good a way as any of exterminating a nest of ants is to dig the nest open and flood it with a kettle of boiling water. If a bushel of quicklime be then thrown in and the earth replaced, the colony will be broken up, and the few ants left will seek other quarters.

Raw Meat.—A very effectual plan of getting rid of ants is to place raw meat in dishes or vessels of any kind about places which they infest, and, as they prefer that kind of food to any other, they surround it in thousands. Boiling water is then poured upon them, and this, if persistently applied, with the bait above recommended, will in time effect a good riddance.

Soft Soap and Potash.—In the "Revue Horticole" for September, 1870, the following method of destroying or banishing ants is described as having proved quite successful:—Take 2 oz. of soft soap, 1 lb. of potash, and about 2½ pints of water. Boil the whole together for some time, stirring the ingredients occasionally. The liquor may then be allowed to cool. With a pointed stick or dibble make holes here and there in the soil infested by the ants, at a safe distance from any plants which may be growing there, to avoid any chance of their roots being injured by the mixture (although this is doubtful), and fill the holes once or twice with the preparation. By this means M. de Forghet was completely successful in clearing his Melon beds of these troublesome insects.

Sweet Oil.—Fill small phials two-thirds with water, and add sweet or any other oil to float on the water to within ½ in. of the top. Plunge these upright in the ground, leaving only ½ in. standing out, near the nest or runs of the ants. The ants will come for a sip and go home to die. No insect can exist with oil stopping up its spiracles or breathing pores.

Treacled Sponge.—In houses and other places where hot water cannot be poured on the soil without danger to the plants, pieces of coarse sponge dipped in diluted treacle will form a most effectual trap. The ants will crowd into the sponges, which should be taken up from time to time and thrown into a vessel of boiling water. Thick treacle spread on pieces of brown paper is also very effective; they get entangled in the mass when sucking it, and their bodies may be swept off the edges at different times till the nests are much thinned of them.

Various.—Turpentine, gas-water, lime-water, a decoction of Elder leaves, chloride of lime, and chloralum dissolved in water, soot, wood-ashes, soap-suds, tar, paraffin oil, and benzoline, have also been recommended.

Water.—If the ants' nest should be in a pot amongst the roots of a plant, the best way is to immerse the pot and plant in cold water, and let it stand for five or six hours, by which time the ants will all be drowned and their eggs destroyed. One of the most simple and effectual ways to destroy ants is to pour boiling water on the nests at night, but in those cases where boiling water cannot be applied recourse must be had to some other remedy.

Yellow Prussiate of Potash.—Yellow prussiate of potash (ferrocyanide of potassium), 1 drachm; raspings of quassia, 1 drachm; sugar in sufficient quantity to form a syrup. The ants are said to devour this greedily and die almost immediately.

It must be borne in mind that in applying any of the above remedies, it may be necessary to repeat the dose several times. The ant is extremely tenacious of life, and is one of the "die-hards" of the insect world. Not only this, but during the breeding season, as instinct leads it to carry off its eggs to a place of safety the moment that danger threatens, the immediate neighbourhood of the nest must be looked after, as well as the nest itself. When the ants are caught alive they must be at once carried away to a distant spot, and either burned or drowned.

Aphides.

The Aphides, of which there are some fifteen reputed species, are amongst the most troublesome of the many insects that find their way to the garden. There is hardly a plant upon which they will not settle, and they multiply so fast that sometimes as many as twenty generations are produced in the course of the season, and a single female may be the ancestor of five millions in the fifth generation. The most destructive are the green fly (Aphis rosæ), which attacks Roses and indoor plants generally; A. pruni, a light green insect, which does much mischief to the Plum trees; A. fabæ, a black fly, which attacks the tops of Broad Beans; and A. cerasi, the black fly, which does so much mischief to Cherry trees. In many cases, from their numbers and the wide field of their attacks, it is impossible to do anything for their destruction. But on all plants grown under glass, as well as the better class of out-door fruits, it is imperative to destroy them. The means for their destruction, in many cases, must be modified according to the different description of plants they infest, as the remedy that may be safely employed in the case of one plant would be death to another, similarly applied. Fumigation with Tobacco, or the numerous preparations made from it, is the most general as well as the best method for their destruction under glass; but, even here, there are numbers of subjects upon which they cannot be killed by this method without serious injury to the plants. This is the case with many Orchids, consequently, where these and similar thin-leaved plants are grown in a house that it becomes necessary to fumigate, they should be removed. And it may be remarked that the more heat, shade, and moisture that is used in the cultivation of this class of plants, the more liable they are to suffer from the effects of fumigation. When such plants as those above indicated are attacked by Aphides, they should be carefully but thoroughly washed with a fine syringe every three days, for a time, using clean water. This matter, however, will be considered more fully under the special heading of "Fumigation."

GREEN FLY (Aphis rosæ).—There is no plant that suffers more from the ravages of Aphides than the Rose, and, where they are grown by the acre, as is the case with those in the trade, it is a difficult matter to do anything with them, but on open exposed grounds of large extent, such as those who cultivate for sale usually have, they do not so often make their appearance as in the often confined and over-sheltered plot of the amateur. Here they are to be met with almost as certainly as the return of spring, and if they make their appearance whilst the leaves are not fully developed, and yet tender, the best means is a good syringing with Tobacco-water. Further on in the season, when the foliage becomes harder, syringing two or three times a week with clean water, or still better, the use of the garden engine will keep them clean; the insects are not able to withstand the continuous application of water, and here it can be used with good effect to the plants in other ways besides the destruction of the insects. Dahlias, Asters, and Verbenas are all plants on which they thrive apace, and, as a general rule, the better the plant suits them the more injury they do to it. These and other plants of similar character require the same treatment as Roses. Peaches and Nectarines are especially their favourites, and the trees are few that escape their attacks every spring, sometimes before, but often just as the trees go out of bloom. They may easily be detected by the leaves beginning to curl before they are half developed. A diligent look-out should be kept at this time, and not a day should be lost as soon as they are discovered in syringing well with Tobacco-water the parts affected. But this is not always effectual unless the trees are syringed with the Tobacco-water all over. This should be always done as soon as any insects are discovered, and one dressing of this description is sufficient, for as soon as the leaves get further developed they will stand the use of the garden engine, used with care regularly twice or thrice a week, which keeps in check those and other pests.

Quassia.—Take 4 oz. of quassia chips, and boil them ten minutes in a gallon of soft water; strain off the chips and add 4 oz. of soft water, which should be dissolved in it as it cools. If the Rose trees are against a wall you may syringe them with this compound; but if they are standards, you must lay the shoots against a piece of slate or wood held in the left hand, and apply the liquid to leaf and stem with a moderate-sized painter's brush. Ten minutes or a quarter of an hour afterwards give the trees a good syringing with clean water.

Soda and Aloes.—The "Rural New Yorker" gives the following preparation as sure death to the Green Fly, as well as many other insects that infest house plants:—Dissolve 2 lbs. of washing soda and 1 oz. of Bitter Aloes, and when cold add 1 gallon of water. Dip the plants into this solution, and lay them on their sides for a short time, and the insects will drop off. Syringe the plants with clean, tepid water, and return them to the house. This mixture proves to be an effectual remedy for vermin on wall trees and hard-wooded plants of robust habit, but it injures soft-wooded plants and tender newly-grown shoots of all plants, especially Vines. It will be found best in all cases to use Barbadoes Aloes, which can be had in quantities at from 1s. 4d. to 1s. 8d. per lb. Cape Aloes may be obtained at 8d. per lb.; it is very inferior to the other, and not cheaper in the end.

Soft Soap and Tobacco.—Dissolve 8 lbs. of the best soft soap in 12 gallons of rain water, and when cold add 1 gallon of strong Tobacco liquor.

Sulphur and Snuff.—Mix 1 lb. of flowers of sulphur, 1 lb. of Scotch snuff, 1 lb. of quicklime, ½ lb. of lamp-black, 1 lb. of soft soap, with sufficient water to make them into the consistence of paint. Unnail the trees about February, before the bloom-buds begin to swell, and with a common paint-brush anoint every branch from the ground upwards. The application must be made every other, if not every year; but once in two years may be sufficient if thoroughly well done.

Tobacco.—Choose a still evening, and let the plants be quite dry. Place them close together, and in a close place thus obtained put either an iron pan or hard-burnt garden pot; put in it a few red-hot cinders that do not smoke, upon which place the Tobacco or Tobacco-paper; a cloud of smoke will soon arise. When the frame is well filled with smoke remove the pan, but be exceedingly careful that the Tobacco does not break out into a flame. One of the best remedies for Aphis that can be employed in a dry state is Tobacco Powder, which can be obtained at all nurseries and seed houses. The foliage should be damp when the powder is applied, and with the aid of the puff sold for the purpose, or a medium-sized dredger, the under side of the leaves, as well as the surface, must be well dusted. Soft-leaved plants, such as Calceolarias and Cinerarias, must be well syringed in about twenty-four hours after the application of the powder. A very effectual remedy in a liquid state is prepared by steeping Shag Tobacco in hot water, at the rate of 4 oz. to the gallon. A little size should be added to ensure the solution adhering to the insects. Immerse the plants, if practicable, bottom upwards in the mixture, or if this cannot be done, thoroughly syringe them, but the first is the most economical method of using it. Shoots of Rose and fruit trees should be dipped separately in a vessel containing the liquid.

Tomato Leaves.—M. Siroy, writing in the "Journal of the Central Horticultural Society of France," says:—"Last winter a Peach tree of mine, which had made vigorous growth, fell off, and a couple of months ago was overrun by Aphides or plant lice, and the ants which always follow in their train. Having one day pruned some Tomatoes, I placed the cut portions upon the Peach tree to protect it from the heat of the sun The following day both lice and ants vanished, except upon the rolled-up leaves where the Tomatoes could not penetrate. I unrolled these as far as possible and placed fresh Tomato leaves upon them, and from that moment the Peach tree has been perfectly free from insects and grows admirably. I followed up my experience by macerating Tomato leaves in water, with which I sprinkled my climbing Nasturtiums, Orange, and Rose trees. All these plants, which were infested with insects, were freed from them in two days. I almost regretted that the clean state of my Melons did not give me an opportunity of trying a similar experiment upon them. Here, then, is a valuable property of the Tomato discovered by the merest accident, for I have never read or heard of it before. Petunia leaves are said to have a similar effect, but in the trials I have made I only achieved partial success, and up to the present time Tobacco has been the only specific remedy. Tomato leaves are much more easily procured than the latter; they are always at hand, and many are wasted in all gardens which can thus be utilised." M. Van Hulle, of Brussels, states that they grow Nasturtiums in Belgian Apple orchards, and allow them to climb up the trees to keep off the American Blight.

Various.—Amongst miscellaneous remedies which have been tried with more or less success, may be mentioned strong brine, Gishurst Compound (8 oz. to the gallon of water), and spirits of turpentine. In applying the last-mentioned remedy care should be taken to prevent its touching the young leaves or shoots.

The best and cheapest remedy for Aphides on Currant bushes is to cut off the curled ends of the shoots, and then wash the bushes vigorously with the garden engine. There is nothing like a stream of clean, cold water for dislodging insects and cleaning fruit trees of all kinds. If this operation be performed continually, no insecticide would ever be required.

BLACK FLY on Cherry trees is generally got rid of by washing or syringing the parts affected with strong Tobacco-water, or gas liquor diluted with one-third water. The ends of the shoots attacked by the pest should be well washed and rubbed with the liquor. The Black Aphis is one of the worst of the family, and is much harder to kill than Green Fly. A second and even a third application of the remedy is generally necessary. The amateur who does not happen to have more than a few trees will find the soapy water from the laundry not a bad substitute for the gas liquor or Tobacco-water when used in the same way. Chrysanthemums—more especially those grown in pots—when out-of-doors in the summer, are very liable to the attacks of Aphides; dip the points of the shoots in Tobacco-water as soon as the insects are discovered, and afterwards syringe every evening with clean water. There is one species of this insect that attacks the roots of Lettuce in summer, frequently destroying the crop in a few days. There is no warning until the damage is too far done to be repaired; the first evidence of their presence being given by a few plants suddenly flagging in the sun. If the roots be examined, they are generally found swarming with the insects; when such is the case, nothing can be done to save the crop. As a preventive, from the middle of June to September, as soon as the plants get 2 in. high, give them a good dressing round the collar with soot, washing it well down to the roots; this generally will be found effective. With bush fruits, especially Currants, which often suffer severely from the ravages of these insects, where they are largely grown, the cost in labour would be too much; where the number of trees is small, if the insects be attacked as soon as they make their appearance, they may be destroyed with clean water from the garden-engine. The Aphides that prey on the Cabbage, Turnip, Peach, Plum, &c., may all be removed by one or other of the above modes of treatment. The Bean Aphis (Aphis fabæ) is best got rid of by plucking off the young shoots and burning them.

Apple Maggot.

The Apple Maggot, which is the caterpillar of a small moth known to entomologists as the Carpocampa pomonella, goes by various names in different parts of the country, such as Apple-boring Grub, Codlin Grub, Apple Worm, &c. It is, as every one knows who has grown Apples on a large scale, one of the most baneful insects that attacks this most useful fruit tree. It is difficult to exaggerate the amount of injury caused by the Apple Grub in England, on the Continent of Europe, and in the United States of North America.

The moth itself is a beautiful little creature; but it is very seldom seen in the moth state, and the grower often knows no more than the man in the moon to what cause he is indebted for his basketsful of worm-eaten windfalls in the stillest weather. To find the moth in the daytime, the trunks of the Apple tree should be carefully looked over; or, if the orchard be surrounded with a wooden fence, the moth may often be found sitting against it, with its pretty wings neatly folded round its body, which is three-eighths of an inch in length, the wings being three-quarters of an inch in width when expanded; the head and thorax are brown; the body, where covered by the hind wings, is paler brown, with a silky gloss; the fore wings are grey-brown; they are delicately barred with dark purple transverse lines, and have on the hind margin a large dark blotch, and within this another blotch almost circular, and bordered with scales of a glittering, fiery copper-colour. Towards evening the moth begins to move, and may then be seen hovering about the little Apples, which by the time it leaves the chrysalis (the middle of June) are well knit, and consequently fit for the reception of the eggs, which it generally lays in the eye of the Apple, only one in each. This is effected by introducing its ovipositor between the leaves of the calyx, which, closing over the eye, forms a tent that effectually shields the egg from the inclemency of the weather or any other casualty. The act of oviposition is not, however, always confined to the eye. When the Apple stands with the eye uppermost, I believe this is invariably the case; but when it hangs eye downwards, as though regarding the earth, the other end of the Apple is used as a receptacle for the egg, which is then dropped into the cavity surrounding the foot-stalk. As soon as the egg hatches, the little grub gnaws a hole in the rind of the Apple, and buries itself in the substance; and it is worthy of remark that the rind, as if to afford every facility to the destroyer, is thinner in the eye than in any other part, and consequently more easily pierced. The grub, controlled by an unvarying instinct, eats into the Apple obliquely towards the centre, thus avoiding the core and pips so essential to the Apple's growth. At first it makes but slow progress, being little larger than a thread, but after a fortnight its size and operations have much increased. Up to this period the grub has availed itself of the very restricted gallery it has made in its devouring career, as a channel through which to force its excrement; and this may always be observed in a little brown heap or mass, either concealed by the leaves of the calyx or around the base of the foot-stalk, according as the egg has been laid at the eye end or stalk end of the Apple. But when it has eaten half-way down the Apple, and the position of the hole at the top, if the Apple continues upright or nearly so, is inconvenient for this purpose, another communication with the outer air becomes requisite; and it must be constructed so as to allow the power of gravity to assist in keeping it clear. It is accordingly made directly downwards towards the part of the Apple which is lowest, and thus the trouble of thrusting the pellets upwards through the eye of the Apple is avoided, and a constant admission given to a supply of air without any labour. The hole now made is not, however, sufficiently open for an observer to gain by its means any knowledge of what is going on within; this is only to be obtained by cutting open a number of Apples as they gradually advance towards ripeness. Having completed this work, and having reached the core, the grub turns towards the cheek of the Apple and makes a third gallery, through which it eventually makes its exit, but not at present, for as soon as it has thus made sure of a means of escape it returns towards the centre of the Apple, where it feeds at its leisure. When within a few days of being fully fed it for the first time enters the core through a round hole gnawed in the hard, horny substance which always separates the pips from the pulp of the fruit, and finds itself in that spacious chamber which Apples always possess in their centre.

From this time it eats only the pips, never again tasting the more common pulp which hitherto had satisfied it; now nothing less than the highly-flavoured aromatic kernels will suit its tooth, and on these for a few days it feasts in luxury. Somehow or other the pips of an Apple are connected with its growth, as the heart of an animal with its life; injure the heart, an animal dies; injure the pips, an Apple falls. The maggot now leaves the core, crawls along its lateral gallery, the mouth of which, before nearly closed, it now gnaws into a smooth round hole, which will permit a free passage without hurting its fat, soft, round body; then out it comes, and for the first time finds itself in the open air. It now wanders about on the ground till it finds the stem of an Apple tree; up this it climbs, and hides itself in some little crack in the bark.

The full-grown caterpillar takes some three or four weeks to reach its full size. The body consists of twelve segments besides the head, which is obtusely triangular, shining, and nearly black; the body is dingy white, with the slightest possible tinge of pink, except on the second and thirteenth segments, counting the head as the first segment, the backs of both of which are nearly black. Every segment of the body after the second has eight very small black warts, and these are arranged somewhat in pairs, and each wart emits a slender hair or bristle, the very pale colour of the body, and likewise the black warts, are more observable before the grub has quite attained its full size, after which period the colour of the body is slightly darker, and the warts are less distinct. The fall of the Apple, the exit of the grub, and its wandering to a place of security, usually take place in the night time. When safely ensconced in the bark it remains without stirring for a day or two, as if to rest itself after the uncommon fatigue of a two yards' march; then gnaws away the bark a little, in order to get further out of the way of observation; and having made a smooth chamber big enough for its wants, it spins a beautiful little cocoon, and within this changes to a mahogany-brown chrysalis, having on each segment of the body a transverse double series of minute warts. The length of time that elapses between the spinning of the cocoon and the transformation from a grub to a chrysalis does not seem to be very constant, for grubs may be found unchanged even as late as March. Be this as it may, it is quite certain that the creature, whether changed or unchanged, remains in the cocoon eight or nine months of the year, and always during the winter months. The caterpillar is duly hatched during the spring, first feeding upon the leaves, and afterwards attacking the fruit. In the case of large trees little or nothing can be done. With dwarf bush or pyramid trees they may, with a little attention, be much reduced in numbers by going over the trees in the spring, and destroying the larvæ as soon as they come to life whilst they are confined to a limited space, being first enclosed in large spider-like webs before they make their exit, from which they are easily destroyed, but if once they escape and become dispersed over the tree, little can be done.

Much may be done by plucking the infected fruit. Mr. F. Francis thus describes his efforts in this direction in a recent number of the " Field " :—" I tried scraping and searching the bark of the trees for the grub, and dressing with Gishurst, &c. I tried trenching the earth beneath them and exposing it to the hardest frosts, and even removing it and replacing it with fresh." Finding these remedies unavailing, Mr. Francis proceeds to adopt another system. " All trees I can get at," he writes, " I search very carefully, and every Apple which I can find bearing any mark of the grub's handiwork—and it is very easily detected—I carefully pick off and have them burnt or destroyed in some way. The first tree I looked over was a young Wellington, some five or six years old, just coming into bearing; I picked off that tree 196 Apples, or more than four-fifths of the crop, which had been pierced by the grub. I then went to a Nonpareil, a great natural bearer, an older and larger tree ; off this I picked 515 Apples one afternoon, and 94 the next morning." In both instances the number of Apples left on these espalier trees was very small indeed; so that these statistics, simple as they appear, will give a good idea of the ravages committed This method is very good as far as it goes if the grub be carefully destroyed, but it does not reach the grubs which had left the fruit before it dropped, and there are, doubtless, many others that escape by making their exit almost immediately after the fruit falls to the ground. The remedy proposed to reach these consists of hay ropes wound round the trunks of the trees, two on each tree, one 2 ft. or 3 ft. higher than the other. This acts as a decoy, affording them retirement and shelter; they make it their hiding-place in which to spin their cocoons. By carefully examining these ropes every few days during the season, large numbers may be secured in the caterpillar and chrysalis state. It is stated that as many as 1000 have been taken in a season in this manner from one tree, and where it has been thoroughly tried along with the first method referred to, good crops have invariably resulted. Pieces of old cloth and various other fabrics have been used in place of the hay ropes with very good results. Complete extermination can hardly be looked for, since with the best management a few will probably escape; but let the fruit grower do his duty, and with the help of birds and insects which prey upon these and similar creatures, there need be little fear of their depredations becoming formidable.

In America, the land of Apples, where this grub commits greater ravages than in Europe, paper bandages are used made of straw wrapping paper, a sheet of which, folded lengthwise thrice upon itself, gives eight layers between 2 in. and 3 in. wide, sufficient to encircle most trees, fastening with a tack, the papers being piled in a heap when done with, and burned. Rags, which are similar to paper, are also used, though much more expensive, but admitting of scalding to destroy the insects. Another contrivance, known as the lath-trap, is said to do great execution. It is made of strips of old sacking 4 in. wide, and lined on one side with thin laths. These are nailed round the tree and dipped into hot water now and then. They are very efficient, but are, of course, much more expensive than straw bands or paper. Another American authority advocates the turning of sheep and pigs into orchards at the time the young and wormy fruit is dropping. These animals will get at least a part of them. One of the most successful experimenters in this way is Mr. Harris, of Rochester, in the State of New York, who gives some striking proofs of the advantages of the practice. He holds the Codlin Moth in check in one orchard by pasturing it with sheep. Another orchard, forty years old, has always been used as a hog pasture, and the Apples are entirely free from the Codlin Moth. Outside the orchard in which the sheep run is a row of seven trees, which produced last year from two to five barrels of Apples per tree, and being unprotected by animals from the Codlin Moth, all the good Apples from these seven trees were put into one barrel. In his garden, where the animals cannot run, from fifty sorts of dwarf Apples there is scarcely a fair specimen. Professor Riley, the State Entomologist of Missouri, highly recommends a trap invented by Mr. Wier, a large Apple grower of Lacon, Illinois, although he does not extol it as a sure Apple Maggot exterminator. The trap consists of four or more thin pieces of board, 12 in. to 20 in. in length, and 2 in. to 4 in. wide, with a screw through the centre, and kept about ¼ in. apart by thin fillets thrust between them.

The screw must be long enough to be firmly driven into the trunk of the tree, so as to hold the boards in position. A half circle, 1½ in. to 3 in. in diameter, is cut out of the boards on each side of the screw, to facilitate their separation when fastened together by the silken threads of the worms, and to expose the latter more thoroughly when the trap is opened. The caterpillars having spun their webs between the boards, the quickest and best way of destroying them is to have a large tin pan bent in on one side so as to fit the tree. When you reach the tree drop upon your knees, place the depression in the pan against the trunk, hold it there by pressing your body against it, and both hands will be free to open the trap by twisting the boards on their axis. Many of the pupæ or chrysalids will fall into the pan, and some of the worms. Kill the rest or scrape them into the pan. The trap must be turned clear round, as many will be found between it and the bark. Seeing, however, that the worms will spin their cocoons between the inner board and the tree as freely as between the boards themselves, it will perhaps be found less tedious and cheaper to detach the traps and kill the worms by wholesale, than to open them on the tree. Another method is to collect the traps by the barrowful, submit them to a killing heat, and replace them; they may be used on the ground as well as on the tree. One of the defects of this trap, which it possesses in common with all other snares or traps for this insect, is that it can never exterminate the Apple Maggot, for many reasons that will suggest themselves to all who have any acquaintance with the insect. Another is, that where one trap only is used it can be attached to but one side of the tree, which plan must be inferior to a trap that encircles the tree.

The tomtits are the natural enemies of the Apple Maggot, which these active birds hunt for with the greatest perseverance during the short winter days. They should therefore be encouraged as much as possible, although they take toll by pecking at a ripe Apple now and then. In orchards bonfires made of weeds, straw, Brambles, and other refuse, may be burnt, the fuel being damped from time to time so as to produce little else than smoke. This operation should take place about the beginning of May, just as the moths are emerging from the chrysalis. Lime, benzol, turpentine, stripping the trees of loose bark, and destroying the chrysalids, have all been recommended, and may be employed in gardens and small orchards; it is, however, the opinion of naturalists and Apple growers that all the remedies that have hitherto been proposed are only partial in their action, and that a perfect panacea for the Apple Maggot still remains to be discovered. Carpocampa pomonella also attacks the Pear tree, but, on the whole, it seems to prefer the Apple.

Apple-tree Mussel Scale.

The Apple-tree Mussel Scale, also called Brown Scale, Turtle Scale, and Tortoise Scale (Aspidotus conchiformis), attacks both the trunks and branches of Apple and Pear trees. It is exceedingly small and of the same colour as the bark to which it is attached, hence it frequently escapes the notice of the casual observer. The Scales are hard, dry, and shining, and are found in large numbers, crowded together even to the extent of lying one over the other. They resemble a minute mussel shell, whence the name. They are slightly curved, transversely wrinkled, roundish at the tail, and attenuated at the head, which is semi-cylindrical, less opaque, and of a rusty colour. They adhere firmly to the bark, having the margins broad beneath and woolly, and when dislodged the place they leave behind is white. Within the shell is found the fat green female occupying part of the cavity towards the tapering extremity, the hinder space being filled up with white oval eggs, numbering fifty or more. Syringing the trees with boiling water or boiling chamber lye, thick brine-wash laid on with a brush, dusting the branches with lime while wet, and painting them with train and linseed oils, have all been tried, but with little apparent effect. Coal-tar naphtha, laid on during the winter, is said to be very effective. Mr. Baines recommends seal oil; every portion of the trees must be thoroughly painted over with the oil, saturating every crevice. This should be done as soon as the leaves are off, for, if done late in the winter, the blossom-buds will suffer. A collection of some fifty trees were dressed with the oil, and it was so far effectual as not to require repeating for a dozen years. The trees were over-vigorous, and the dressing checked their growth to something like what root-pruning would have done. They bore splendidly afterwards. It will at once be seen that a dressing of this description is only possible on trained trees of moderate size; with large orchard trees it would be out of the question, for unless the whole surface of the bark is touched with the oil, the results will only be partial. Pears on walls require unnailing, so as to get thoroughly to the back of the trees, brushing the oil in as for the Apples.

Asparagus Beetle.

Foremost amongst the causes which tend to diminish the yield of Asparagus, we must class the attacks of the Asparagus Beetle (Crioceris asparagi) which abounds more in some seasons than in others, and is sometimes very destructive in one locality and almost unknown in others. The larvæ feed upon the leaves, perforate the buds, and even gnaw the rind of the stems. When the beetle first appears it may be controlled, but if allowed to become established the task is hopeless. Whenever the eggs or the larvæ appear, cut and burn the plants as long as any traces of the insect are visible. The larvæ, beetles, and eggs are generally found from the middle of June to September; its larva state continues only for about ten days, after which it descends into the earth to undergo its changes; and in three weeks the perfect beetle is formed, when it ascends the plants to deposit its eggs. The beetle, after eating into the vegetable, lays its eggs in the tender, juicy portion of the stalk and leaves, and when the larvæ (the produce of the eggs) issue forth, they totally destroy those parts of the plant with which they come in contact. The most efficient plan of dealing with this insect-plague is to collect and "stamp out" the young brood, or better still, the full-grown beetles, before they have laid their eggs. The work of collection must, however, be carefully proceeded with, for with the slightest movement the beetles will fall down and conceal themselves in the earth. After a time they reappear, and, if permitted, will crawl again on to the plant, lay their eggs, and recommence feeding. In his war of extermination with the beetles, the Asparagus-grower has no better friends and allies than small birds. If he be wise he will do all in his power to attract and protect them.

Asparagus Fungus.

The first symptoms of Asparagus Fungus are observable in August. Small dark brown spots, which in a few days attain the length of one-tenth to one-fifth of an inch, appear on the stalks, and gradually assume a much darker shade. These spots are surrounded by the ruptured epidermis of the stalk, and are somewhat inflated. On close examination, vertical layers of small powdery spots are remarked under the epidermis; and it is their great accumulation here and there which causes the latter to burst. On one point, viz., the dangerous character of the disease, there is unfortunately no room for doubt, and the grower has every reason to be careful that it shall not gain ground, or be imported into districts hitherto free from it. Above all things, he must endeavour to prevent the discharge of the spores—the organs of reproduction—and, as soon as any signs of disease show themselves, his best course is to remove the parts attacked and burn them. Another remedy is to cut a trench round the infected plants, so as to stop the progress of the fungus, for, like most others, it radiates from a centre. It might be that quicklime frequently applied would avert its progress, if not destroy it, few fungi resisting its caustic effects.

Asphalte Walks.

The so-called asphalte used for garden walks has nothing in common with true asphalte, as used for the streets in London and Paris. The excellent walks in the metropolitan parks, on the Thames Embankment, in Leicester Square, &c., are made by Mr. Meston in the following manner:—The foundation is made in the usual way with 6 in. of brick rubbish, ballast, or rough gravel, over which is placed a layer of the prepared rough material 2 in. deep, this being well consolidated by a heavy roller; then a layer of the fine material, about 1½ in. in thickness, is evenly spread and well rolled, applying water to the roller to prevent sticking. It should then be sprinkled over with Derbyshire spar or fine beach shingle. Either of these improves the colour and keeps the dark compound of which the walk is made from being seen. The materials are prepared in the following manner:—A strong fire is made of coal and wood, over which is placed a layer of gravel, out of which the fine part has been roughly sifted. Then a layer of coke breeze is laid over the gravel, and when the fire has got through the gravel, another layer of gravel is placed over the breeze, and so on until the quantity required has been burnt. While in a hot condition the material is passed through sieves of different sizes to get rid of the fine dust and separate the material into two sizes, coarse and fine. A flooring of planks is laid near the heap on which the sifted material is placed and mixed with coal-tar in the proportion of 36 gallons to a yard of material. The rough and fine are laid in separate heaps and used as required.

—— The place intended to be asphalted must be previously levelled, then put on it a coat of tar, and sift some road-sand or coal-ashes over it very thickly; when this is dry repeat the operation, until you have got four coats of tar, and as many of coal-ashes or road-sand. You will then have an excellent, clean, dry, hard path. It will make excellent walks, or floors for sheds, out-buildings, &c., and will wear for many years.

—— Take eighteen parts of mineral pitch, and eighteen parts of resin, put them into an iron pot, and place it over a fire, keep boiling a short time; then add to it sixty parts of coarse sand, mix it well together, and lay it on the path to the thickness of 1 in.; then sift a little fine gravel over it, and beat it in before the asphalte sets. This is a more durable asphalte than the former, though it is much more expensive and more troublesome to form.

—— Another good asphalte may be made with one part mineral pitch, one part resin, seven parts chalk, and two parts coarse sand. Boil them together, and lay it on in a hot state, adding a little gravel, as in the preceding case.

—— Procure a quantity of road-sand, or similar powdery material, and let it be thoroughly dried, then sift out of cinder-ashes the finer parts, and let that too be made thoroughly dry. Mix these materials carefully, in the proportion of two parts of road-sand to one of cinder siftings. Next provide an iron cauldron, in which coal-tar can be made boiling hot. In a dry place, on a dry day, spread a quantity of the sand and cinder siftings on the ground, as a bricklayer spreads his lime, making it hollow in the middle, and into that pour the hot tar; then incorporate the whole as in the operation of making mortar, and when a stiff paste has thus been formed, spread it over the ground on which the walk is to be constructed, the ground being previously levelled and beaten as firm as possible. Spread the mortar 3 in. or 4 in. in thickness, then powder it over with dry sand, after which a few passes of the roller will press it level, and the work is finished.

—— Take two parts of very dry lime-rubbish, and one part coal ashes, also very dry, and both sifted fine. In a dry place, on a dry day, mix them, and leave a hole in the middle of the heap, as bricklayers do when making mortar. Into this pour boiling hot coal-tar; mix, and when as stiff as mortar, put it 3 in. thick where the walk is to be; the ground should be dry, and beaten smooth; sprinkle over it coarse sand. When cold, pass a light roller over it: in a few days the walk will be solid and waterproof.

—— The true Asphalte used for roads and foot-pavements in London, Paris, and elsewhere, is made from a natural bituminous limestone found at Val de Travers in the Canton of Neufchatel, in Switzerland, and at Pyrimont, near Seyssel, a small town in the department of the Ain, on the right bank of the Rhone. The preparation and laying of true asphalte being in the hands of public companies, it would be out of place to describe them here.

—— To harden asphalte that has become soft, give it a coat of coal-tar on a hot day; this will dry in a few days; then boil tallow, pitch, and the tar together, in the proportion of one part tallow, three of pitch, and four of tar. Apply this on a hot day, and, if properly done, roofs or paths will require no further care for years. Ten feet square may be tarred with a sweeping brush in ten minutes.

Birds and Seeds.

Seeds of every size and description are subject to the attacks of birds, more particularly in small gardens. In market gardens, where Radishes are sown by the acre, a boy is regularly employed to keep off these marauders. In the small breadth required in a private garden it would not pay to employ labour in that way, yet if nothing be done, a very few finches would, in a single day, destroy a crop. The best remedy is to dress all seeds with red lead. The dressing, to be effectual, must be done thoroughly. The best method is to place in a large tea-saucer as much seed as it is the intention to sow, on which sprinkle a very few drops of water, for if they be made too wet, the seeds and the lead will stick together in a mass; then take a teaspoonful of dry, powdered red lead, and stir the whole thoroughly until all the seed is well coated with lead; let it stand for a couple of hours to dry before sowing—this is necessary, or the lead will wash off with the rain; whilst, if laid on with the right amount of moisture, and well dried, it will adhere to the outer covering of the seed, even when it appears above ground. With a little practice in the preparation of the various seeds that thus fall a prey to birds, the amateur will soon be able to judge when he has hit upon the right degree of moisture required before applying the lead, and upon which depends the perfect preparation. Half a pound of red lead will last a season, and the trouble is nothing when compared with the blank crops. Paraffin oil has been also recommended. An experiment lately made for the purpose of testing its power to keep birds from eating seeds when sown, proved so far successful that, of a handful of Radish seed soaked in the oil for fifteen minutes and then sown, not a seed appeared to have been taken, for all came up freely, and no protection was afforded, although birds were very abundant.

Petroleum or benzoline would of course answer the same purpose.

Bleeding in Vines.

This seldom occurs, except in the case of late Vines, on which the Grapes are allowed to hang until the sap begins to flow, and which consequently bleed when pruned. The most effectual remedy, therefore, is to cut the Grapes as soon as the wood is ripe and put the stalks of the bunches in bottles of charcoal water, in which they will keep as soundly and well as if left on the Vines. The latter can then be pruned while in a dormant state, when bleeding will, as a matter of course, be prevented. When, however, bleeding does occur, the following remedies will be found to be effectual:—

Collodion.—One of the best styptics is collodion, an invaluable remedy for stopping the bleeding of Vines, or for coating the bases of cuttings which are extremely liable to damp off. It can be applied with a feather or small brush. In some extreme cases two or three coats will be needed, in which case allow the collodion to form a film before applying another coat. Pharmaceutical collodion is better than photographic for this purpose, the film being thicker and firmer.

Hot iron.—Apply a hot iron to the bare surface until it is charred, and then rub into the charred surface a paste made of newly-burnt lime and grease.

Knight's Plaister.—This is considered a very effectual application, and is thus made:—One-fourth of calcined oyster-shells or ordinary quicklime beaten to fine powder in a mortar, and three-fourths of cheese, worked together until they form a sort of paste. This mixture is to be forced into the pores of the wood, where bleeding takes place, by means of the thumb and finger. A second application is sometimes necessary.

Tar.—It often happens that, either by intention as in pruning, or by accident, other trees besides the Vine are wounded in various ways. A common practice is to cover large wounds with coal-tar, but this is objected to by some as injurious to the tree. Experiments made in the orchards and gardens of the Pomological Institute, at Reutlingen, in Germany, go to show, however, that its use in covering large wounds is not injurious; but that, on the contrary, a callus readily forms under the tar on the edges of the wound, and that the wounded part is thus protected from decay. There is, nevertheless, another objection, viz., if the tar be applied a little too thick, the sun melts it and it runs down on the bark of the tree. This can be obviated by mixing and stirring, and thus incorporating with the tar about three or four times its weight of powdered slate, known as slate flour—the mixture being known as plastic slate, and used for roofing purposes. It is easily applied with an old knife or flat stick, and though it hardens on the surface, it remains soft and elastic underneath. The heat of the sun does not melt it, the coldest winter does not cause it to crack, neither does it peel off.

Tobacco Dust.—Mr. Baillie, of Beaufront Castle, Hexham, gives the preference to Tobacco dust. He says:—After pruning our early Vinery this winter a Muscat of Alexandria commenced bleeding profusely from more than one wound, owing to its proximity to a warm drain, through which pipes are led to a range of plant-houses. We tried various remedies for stopping the bleeding, but without effect until we used Pooley's Tobacco dust, which was rubbed well into the wounds, dusting them afterwards with the dry dust. The effect was almost instantaneous, the wounds being sufficiently dry in a few hours to receive a dressing of Thomson's Styptic. Many Vine-growers use Stockholm tar with a little ochre or umber to give it more substance.

Boiler Incrustations.

Ordinary boiler incrustations, resulting from the use of hard water, consist chiefly of carbonate and sulphate of lime, the former salt always being in excess. Carbonate of lime separates itself gradually from hard water when the temperature is raised to the boiling point, and in the course of time assumes a crystalline form. Hard crystalline masses or stone-like deposits are thus formed in steam boilers, which greatly interfere with the economical production of steam. The best plan of preventing the formation of boiler deposits is to soften the water by Clark's lime process, which is described below. The next best plan is to add to the water a solution of caustic soda; to allow the precipitate to settle, and to use the clear water for feeding the boiler; or if it be considered too much trouble to soften the water in this way, caustic soda dissolved in water may be put into the steam boiler. By this means the precipitation of the carbonate of lime, as well as the removal of the sulphate of lime is effected, and the small amount of lime which does fall down is far less crystalline than it is when no precipitating agent is employed. The formation of crystalline and hard incrustations in boilers may also be prevented to a great extent by placing in the boiler Potato peelings, spent tan, peat-mould, coarse sawdust, or chips of Oak wood and bark, or similar materials which act in a purely mechanical manner in preventing the agglomeration of crystalline particles of carbonate of lime into hard masses. Several compositions sold as preventives of boiler incrustations act mainly in a mechanical way, and others in part chemically and in part mechanically. A favourite composition sold under various names consists of a combination of crude tannic acid, produced from gum catechu or Oak bark, or other astringent raw materials with bone gelatine or glue. Crude tannic acid and caustic soda are likewise constituents of several fluids recommended as preventives of boiler deposits. The following is the principle of Dr. Clark's process:—Carbonate of lime is scarcely soluble in pure distilled water, a gallon being capable of holding only about 2 grains in solution. In river or spring water, however, carbonate of lime is held in solution by carbonic acid, or, in other words, exists as bicarbonate of lime. On boiling, the second equivalent of carbonic acid in the soluble bicarbonate is expelled, and neutral carbonate of lime precipitated. Caustic lime, when added to hard water in sufficient quantity, neutralises the carbonic acid, removes the solvent, and becoming at the same time carbonate of lime, is precipitated with that originally in solution. Clark's process is peculiarly well adapted to the softening of chalk springs, which owe their hardness almost entirely to carbonate and not to sulphate of lime, a constituent which cannot be removed by heating or by the lime process, and which renders water permanently hard. The composition of spring or well water from the chalk strata varies but little in different localities. ½ lb. of caustic lime made into milk in a pailful of water, may be thrown into the tank for every 400 gallons used in the boiler. When caustic soda is used, about 2 oz. or 3 oz. to every 100 gallons of water should be thrown into the boiler. An excess of caustic soda will not injure the boiler in any way. All depends, however, on the hardness of the water, which can only be ascertained by experiment.

Cabbage Grub.

In old soils all the Cabbage kind, Broccoli and Cauliflowers especially, have a tendency to form club roots, owing to the attacks of the Cabbage Grub or larva of the Curculio contractus, a small insect belonging to the beetle tribe. The damage it causes is often a serious matter for the gardener, as it nearly destroys whole crops, and makes very inconvenient gaps, especially in summer Cauliflowers. When the grubs first attack a crop there is nothing to indicate their presence until the plants begin to turn an unhealthy colour; then they flag in the sun, and in a few days the crop is lost. There is no variety of the Cabbage tribe quite free from this pest, although the different kinds of Winter Kale, as well as Red Cabbage, are less frequently affected than Cauliflowers and summer Cabbages.

Lime and Soot.—One of the best methods of preventing the inroads of Cabbage Grubs is to make each plant unpalatable to them. In the spring procure some newly-burnt lime, and lay it under cover until it becomes air-slaked. Then take an equal quantity of soot and mix it with the lime. In planting, the holes are made with the trowel in the usual way; each plant is dropped into its hole, an inch or so of the soil put over the roots, a good watering given first, then a moderate handful of the soot and lime mixture thrown in each hole, and the remaining soil filled in.

Soot and Garden Soil have also been recommended as a specific. Take equal parts of soot and fine garden soil, thoroughly mix them with water to the consistency of thin mortar, and dip the plants in the mixture up to the base of the leaves before planting. This is said to be a safe and never-failing preventive of clubbing.

Wood Ashes mixed with water and put into the holes after watering is also a favourite remedy in wood-burning districts. Some ashes should also be incorporated with the soil of the seed-bed, as well as strewed over the ground generally.

—— Another remedy is to dip the roots of the plants before putting them into the ground into a mixture of soot and water, with the addition of a little saltpetre. This should be made of the consistency of thick paint, using 1 lb. of saltpetre to each gallon of soot. Charcoal dust, spread ½ in. thick on the plot, and then just mixed with it by the edge of the spade, will sometimes act as a preventive, and is always of some benefit. A dressing of lime from the gasworks, at the rate of twelve bushels to the acre, has also been found effectual.

In applying the above remedies great care must be taken not to put in the mixture first and water the plants afterwards, as this would have the effect of washing the stems clean and taking the mixture down into the soil away from where it is required, thus affording no protection to the plants.

Caterpillars.

CABBAGE CATERPILLAR.—One of the best methods of diminishing the ravages of this pest is by destroying the chrysalis before it is transformed into the egg-laying, perfect butterfly. When preparing to enter the chrysalis state it leaves the plant on which it has so greedily fed, and seeks a safe retreat and a firm object to which it may attach itself by its silken moorings. The places of retreat most generally selected are the under surface of projecting copings and joints of garden walls, doorways, chinks or hollows in stone-work or the under surface of the gutter, beam, wall plate, slips, or other woodwork of Vineries or plant-houses. When the place is fixed upon the transformation commences, and the Caterpillar becomes the apparently lifeless chrysalis, firmly fixed by a cord of silk to the surface it has selected for its resting-place. It is as well to employ a boy and stimulate his exertions by the promise of a few pence for every pint of chrysalis he collects from the garden and its surroundings; this will be found the best means of abating the Caterpillar pest.

Bracken.—A writer in the "Belgique Horticole" having observed in the garden of a peasant that the Cabbages were covered with fronds of the common Bracken (Pteris aquilina), inquired the reason, and was told by the owner that it was a certain and easy way to get rid of the Caterpillars. He made a trial of the remedy himself, and he states that in one hour after the Bracken fronds were laid on not a Caterpillar was to be seen. Elder leaves are said to be equally efficacious.

Hemp.—M. Ad. Sucy, in a letter to the "Revue Horticole," recommends the use of Hemp for the purpose of destroying Caterpillars. He says:—Many years ago I saw an individual sowing broadcast a coarse grey powder on beds of Cabbages, which were almost devoured by legions of Caterpillars. On inquiry I found that this was nothing else than the refuse of beaten Hemp, and consisted of fragments of the dried and broken leaves, and particularly of the crushed seed-vessels. In half-an-hour all the Caterpillars had fallen down dead, as if suffocated. He then goes on to suggest the sowing of rows of Hemp in beds of Cabbages, Cauliflowers, &c., stating his impression that the odour of the Hemp plants would exercise a sufficiently repulsive influence to protect the vegetables from the attacks of the Caterpillars, and concludes by expressing his opinion that watering Cabbages, &c., with water in which Hemp had been steeped would be attended with equally beneficial results.

Celery Fly.

The larvæ of the Celery Fly (Tephrites onopordinis) in some seasons do much mischief to the Celery crops, and as yet no effectual remedy has been discovered. When Celery is infested with the larvæ the leaves become blistered and turn yellow, and as the grubs are underneath the blisters, they may be crushed between the finger and thumb. The grubs, when full-grown, descend into the earth, and remain in the chrysalis state until the following spring, when they give birth to the Fly, which in due course deposits the eggs on the leaves. Therefore, to prevent the attack of the pest next year, leaves badly infested should be removed and burnt, to prevent the grubs attaining their full development. Mr. Rose, of St. George's Hill, Byfleet, having been for some years troubled with Celery Fly, filled a 36-gallon water-barrow with sufficient water to dissolve two 1-lb. boxes of Gishurst Compound, mixing with it 1 lb. of Pooley's Tobacco Powder, and filling up the whole with boiling water, stirring all well together. The mixture, after being allowed to stand for some twenty-four hours, was used to water the affected Celery plants—a watering can with a very fine rose being employed for the purpose. The plants, having been well saturated with this mixture, were then examined, and the grubs which had burrowed into the leaves were all found to be dead. The crop, too, seemed to be greatly improved, the mixture having evidently acted not only as an insecticide, but as a fertiliser. About three weeks after he repeated the same treatment with another crop, with precisely the same results.

Cements.

It may, perhaps, be necessary to explain that the word "parts" in the receipts given below means parts by weight, *i.e.*, pounds, ounces, drachms, or grains.

Boiler Cement.—(1) Chalk, 60 parts; lime and salt, of each 20 parts; sharp sand, 10 parts; blue or red clay and clean iron filings, of each 5 parts. Grind together and calcine. Used to stop cracks and leaks in iron boilers, pipes, stoves, &c. (2) Powdered clay, 6 lbs.; iron filings, 1 lb. Make into a paste with linseed oil. (3) Powdered litharge, 2 parts; silver sand and slaked lime, of each 1 part; boiled oil enough to form a paste. Must be used directly it is made, a remark that will apply to all Cements of this class. See also "Iron Cements" (p. 30).

Bottle Cement.—(1) Resin, 5 lbs.; beeswax, 1 lb. Stir in sufficient red ochre and Brunswick green or lamp-black to give the desired colour. Used for sealing bottles, barrels, &c. (2) Black pitch, 6 lbs.; ivory black and whiting, of each 1 lb.; to be melted together. This is cheaper than the above and quite as effectual, but it does not look so well.

Coppersmiths' Cement.—Bullock's blood thickened with sufficient finely-powdered quicklime to make it into a paste is used to secure the edges and rivets of copper boilers, to mend leaks in joints, &c. It must be used immediately it is mixed, as it soon gets hard. It may be used for many other purposes, which will easily suggest themselves.

Earthenware Cement.—Grated cheese, 2 parts; quicklime in fine powder, 1 part; fresh white of egg enough to form a paste; the ingredients should be thoroughly incorporated and laid on as soon as possible. Used for china and earthenware. For fine work liquid glue may be used.

Fireproof Cement.—Fine river sand, 20 parts; litharge, 2 parts; quicklime, 1 part; linseed oil enough to form a thin paste. Applied to walls it soon acquires a stony hardness. It is also useful to mend broken stonework.

Glass Cement.—Dissolve 6 pieces of gum mastic the size of a large Pea in as much methylated spirit as will suffice to render them liquid; in another bottle dissolve the same quantity of isinglass, previously soaked in water and allowed to get surface-dry, in 2 oz. of methylated spirit; when dissolved add 2 pieces of either gum galbanum or gum ammoniac, applying a gentle heat and stirring; add the solution of isinglass, again heating and stirring. Keep in a tightly-stoppered bottle, and when wanted for use set the phial in boiling water. This Cement, when carefully prepared, is perfectly colourless, and is used for uniting delicate glass vessels. The edges of the broken article must be warmed and pressed tightly together to squeeze out the superfluous Cement : for broken flower vases this will be found the best. An excellent Cement for stopping cracks in glass vessels, to resist moisture and heat, is made by dissolving pressed curd in a cold saturated solution of borax. With this solution paste strips of hog's or bullock's bladder, softened in water, on the cracks of glass, and dry at a gentle heat. If the vessel is to be heated, coat the bladder on the outside, just before it has become quite dry, with a paste of a rather concentrated solution of washing soda and quicklime or plaster of Paris.

Hydraulic Cements.—These are cements which have the property of hardening under water. There are several of them sold under different names, but the best is that known as Portland Cement. Its principal uses in the garden are obvious; amongst those which are not so apparent are the following:—When made into a thin solution like whitewash, this Cement gives woodwork all the appearance of having been painted and sanded. Piles of stone may be set together with common mortar, and then the whole washed over with this Cement, making it look like one immense block of grey sandstone. For temporary use a flour barrel may have the hoops nailed, so as not to fly apart, and the inside washed with a thin paste of Portland cement, and it will serve for a year or more to hold water. Boards nailed together and washed with it make good hot-water tanks; and it is of use in so many ways that it may be regarded as one of those peculiar things in a garden which it is always good to have at hand.

Iron Cements.—These are used for closing the joints of water pipes and similar purposes. We select the following from a large number of formulæ:—(1) Sal ammoniac, 2 oz.; sulphur, 1 oz.; clean iron borings or filings reduced to powder, 12 lbs.; water enough to form a thick paste. (2) Sal ammoniac, 2 oz.; iron borings. 8 lbs.; sufficient water. (3) Some authorities state that the strongest Cement is made without sulphur, and with only 1 or 2 parts of sal ammoniac to 100 of iron borings. When the work is required to set quickly, the quantity of sal ammoniac should be slightly increased, with a very small amount of sulphur added: this addition makes it set more quickly, but reduces its strength. No more of these Cements should be made at a time than required, for they soon spoil. (4) Iron borings, 4 lbs.; pipe clay, 2 lbs.; powdered potsherds, 1 lb., made into a paste with moderately strong brine produce a cement of great strength when allowed to harden slowly. It is an excellent material for mending cracks in boilers. (5) Equal parts of red and white lead mixed into a paste with boiled linseed oil, form excellent Cement for making metallic joints of all kinds. A washer of hemp, yarn, or canvas smeared with the Cement, is placed in the joint, which is then screwed up tight. It also serves to join broken stones, and when brought to the proper tint by the addition of the necessary colour, it is very handy for mending chipped stonework, balustrades, vases, &c. (6) To four or five parts of clay thoroughly dried and pulverized, add two parts of iron filings free from oxide, one part of peroxide of manganese, one-half of sea salt, and one-half of borax; mix thoroughly, and render as fine as possible; then reduce to a thick paste with the necessary quantity of water, well mixing the mass. It must be used immediately. After application it should be exposed to warmth, gradually increasing almost to white heat.

Liquid Glue.—Finest pale orange shellac broken small, 4 oz.; methylated spirit, 3 oz.; digest in a warm place in a closely corked bottle until dissolved. It should have the consistency of treacle. Or, borax, 1 oz.; water, ¾ pint; shellac as before, 3 oz.; boil in a closely covered vessel until dissolved; then evaporate until nearly as thick as treacle. The first dries very quickly, the second much more slowly. Used for common glass, china, wood, stone, &c. When used for wood, a layer of very thin muslin should be interposed. The Chinese archers mend their bows with this Cement. It may also be used for fixing paper to wood, metal, or glass when exposed to damp. Paper labels cemented on to wood with this composition and then dipped into melted paraffin will stand the weather for an almost indefinite period. It cannot be too strongly insisted upon, that the less Cement there is between the edges of any mended article, the less likely they are to part company.

Tar Cement.—Coal-tar, 1 part; powdered slate (slate flour), 3 or 4 parts; mix by stirring until thoroughly incorporated. This forms an excellent Cement for some purposes; it is easily applied with an old knife or a flat stick, and though it hardens on the surface it remains soft and elastic underneath. The heat of the sun does not melt it, and the coldest weather does not cause it to crack or peel off. Leaky watering-pots, barrels, pails, shutters, sashes, &c., can be easily repaired with it, and much annoyance and loss of time be thus avoided. It will stick to any surface provided it be not oily, and as it does not harden when kept in a mass, it is always ready for use. A gallon will last for a long time.

Cockchafers.

The Melolontha vulgaris, or common Cockchafer, is a most destructive insect, both as a grub and in the perfect condition. The remedies which have been proposed and tried, with more or less success, are numberless; almost all, however, bear upon the dislodging of the insects from a particular spot, rather than upon a more summary mode of dealing with them. Perhaps the most efficacious is the collecting of the insects and their grubs. The collecting, however, must be continuous and not intermittent, and must be persisted in as long as any are to be seen; and to have a fair chance of success it must be followed, not only by one, but by all neighbouring landholders at the same time. For the perfect insect it ought to take place either very early in the morning or on a very rough day, when the Chafers are hanging loosely to the trees with drawn-up legs, and when a slight shake or blow with a stick will bring them to the ground. On warm, sunny days they can be seen to be very lively from six o'clock in the morning, and on shaking the trees they fly away or rise from the ground in a manner which increases the difficulty and seriously lengthens the task of gathering them and putting them in sacks. Sacking spread out under the trees greatly assists in the speedy collecting, saving time, and likewise the trouble of much stooping. The grubs, again, are collected in working the ground. Here the depth at which the insects are lying at the time must be kept in mind, in order that the plough may bring them to light, and when gathered together, although the impression is correct that they cannot stand the sun, they should under no conditions of weather be deposited in heaps, even upon a firmly-trodden path, as the undermost can easily bore their way through the ground again, and a part of the trouble taken will be thrown away. Spread flat upon firm ground, with a hot sun shining upon them, they will soon be dead; if there be no sun, they should be put in some wooden tub, or in a watering-pan. An experienced French gardener gives the following remedy as effectual:—In June, where it is possible, he sows in the garden particularly infested by Cockchafers, and where a large brood may be expected, rows of salad, which it is well known the grubs are fond of, and by which they are enticed. In August these places are hoed in a hot sun, thus turning up the young grubs gathered round the salad, and if left exposed the sun soon kills them. This simple work is repeated several times on a very hot day, and according to the assertion of our informant, during the four years in which he had followed it out he had suffered nothing from the grubs. Mr. Booth, the well-known nurseryman, of Hamburg, says:—"About ten years ago we suffered terribly from Cockchafers, whole plantations of Rhododendrons and Conifers being completely destroyed by them. Against such devastation all artificial remedies were more or less powerless. We then adopted the starling plan. We caused 100 breeding cages to be made of the very simplest construction, and in the spring they were all occupied. As soon as the Cockchafer comes, or is coming out of the earth the starling is there; it picks the Chafer clean out, tapping about on the ground with its beak until it finds it. Beside almost every hole from which a Cockchafer has escaped one might find the wings and whatever is uneatable, proof enough that the Chafer's enjoyment of life had not been of long duration. We increased the number of cages, and have now from 175 to 200. We have since then had plenty of Cockchafer years, but have not again experienced such injury from them, and in working the ground to a greater depth for them the number of grubs found is comparatively few."

—— Another remedy very frequently adopted by French gardeners is to thickly sow the affected ground in autumn with Colza, which is ploughed in as soon as the first frosts begin to make their appearance. Half-decayed Cabbage leaves, or indeed the refuse of any Cruciferous plant, should be ploughed in at the same time. It seems, after a prolonged and careful examination, that the Cockchafer grub cannot stand the leaves of any of the Cruciferous plants in a state of fermentation, the sulphurous emanations given off by them being poisonous to the insect. Planting Cabbages or Turnips in ground infested by the Cockchafer grub is said be effectual in driving them away.

—— Another method, which can only be applied in woods, coppices, and plantations, is described in the "Merseburgher Official Journal" as having been successfully tried in a nursery belonging to the Royal Forestry at Bischoffsröde, comprising 1½ acres of land, and surrounded by high trees, especially by Oaks, completely ravaged by Cockchafers. Just before the flying time of these destructive insects, seventeen different spots were artificially prepared as breeding places in the following manner:—Alongside the paths, and near the fences, from 3 ft. to 4 ft. square of ground were covered with fresh horse or cow manure from 5 in. to 6 in. in height, without mixture of straw or any other material; upon this were laid 2 in. or 3 in. of fresh earth, nicely smoothed down and raked. These spots were carefully watched during the flying season, but, owing to the absence of any bored holes, were left undisturbed until the middle of July, when it was discovered that in those spots exposed to the sun the manure was a living mass of grubs ¼ in. in length, whilst in those places more in the shade the number of eggs was inconceivable. These heaps were brought together and collectively burnt outside the nursery.

Cockroaches.

Cockroaches are often great pests in plant-houses, Mushroom beds, and private houses, where they devour everything within their reach.

Arsenic.—Mix some arsenic with honey, and lay it on scraps of paper about the floor for them to eat. If Arsenic be mixed with boiled Potatoes, and laid about in the same way, it will answer the same purpose.

Bracken.—Another remedy is said to be to procure some Bracken, Pteris aquilina, or common Fern, plentiful on commons, and put it down about the house at night. The black beetles will eat it ravenously and soon die, and their relatives will pick their bones. It is commonly used in the north of England.

Honey.—Mix some honey and water together. Two teaspoonfuls of honey will be ample for half a common basinful of water; put the basin on the floor at night, half filled with the mixture, and place three or four small sticks, about ½ in. wide, to rest on the edges of the basin for the Cockroaches to walk upon. They will fall into the liquid and get drowned. Some tumbler-glasses half filled with the mixture, and sunk to the rim in pits in the tan or soil, make excellent traps for them. Porter and brown sugar is said to be equally efficacious.

Oatmeal.—Bait them well with oatmeal for three or four successive nights, or until such time as they feed greedily on it; then mix some arsenic with the meal for one night, repeating the process from time to time if necessary. Mr. Wilson states that if a bowl be wrapped round with a wet cloth they will get into the bowl, from which they cannot escape.

Phosphorus.—A very simple and effectual remedy is given in the "Revue Horticole," communicated by M. Loury, chief propagator at the Jardin Fleuriste, Paris. It is as follows:—Dissolve the heads of a couple of boxes of common phosphorus matches (not *Safety* matches) in a pint and a half of water; then mix with it about 1 lb. of flour, and add about ½ lb. of sugar, of which these insects are very fond. The mixture may then be distributed in various parts of the house overnight on pieces of board, slates, &c., and when examined in the morning, numbers of dead cockroaches will be found close to wherever the poison has been laid.

The remedies given for Crickets are equally effective in the case of Cockroaches.

Concrete for Floors and Walks.

After the ground on which the floor or walk is intended to be made is levelled, let it be covered to the thickness of 3 in. or 4 in. with stones, broken small, and well rammed; upon which let there be run, about 1½ in. above the stones, one part, by measure, of Portland cement, and two of coarse sand and fine gravel mixed to a thin consistency with water. Before this coating has become thoroughly set, lay upon it a coat of Portland cement mixed with an equal part of fine sand, and ½ in. thick. The addition of blood will render this compost harder. Concrete for weak foundations, and for the bottoms of cattle-boxes and manure-pits, when not sufficiently stiff and sound to be impervious to water may be made as follows;—Newly-burned lime ground to a fine powder, 2 parts; Portland cement, 1 part; gravel, broken stone or brick, 6 parts. Mix the above with water to a liquid consistency, and let it be thrown into its position from a height of 10 ft. or 12 ft., and when partially set let it be well beaten or rammed to render it solid.

—— Another Concrete for the last two foregoing purposes and also for garden walks:—Equal parts of gravel, well screened, and clean river or pit sand. With five parts of the mixture of gravel and sand, mix one part of Portland cement. Mix with water, and apply 2 in. thick.

—— For fruit tree borders, having made the excavation, put in a 3-in. layer of coarse gravel, ram it firm, and then run with concrete, formed of 9 parts gravel and 1 part unslaked lime; slake it, and cover it with the gravel, then add sufficient water to bring the Concrete to the consistency of very thin mortar; a thickness of 3 in. of Concrete will be necessary. It ought to be made so thin that it must be carried in a bucket. The gravel used should be of the same kind as put upon walks. Let the Concrete stiffen a little until it will bear treading upon; then roll it firm, or ram it hard, leaving a smooth surface. Let it stand until firm, and then finish with an inch thick of fine gravel mixed with lime, in the proportion of 1 part lime to 3 parts of gravel, and this mixture cannot be too soft. When it becomes stiff and hard, as it will in a few days, put in the rough stones for drainage, not less then 6 in. in thickness, and the drain along the front, which should be placed on the Concrete and be covered with the drainage. If you do not object to the expense, 1 part in 6 of Portland cement added to the lime and gravel for the last 1-in. coating would be more certain to prevent the roots penetrating the Concrete, though we never knew them pass the lime and gravel. In place of 1 in. thick of lime and gravel, you may have a layer ½ in. thick of Portland cement 1 part, and fine gravel 3 parts. This when run and dry will resist anything, but it would be more costly.

Crickets.

Crickets are often troublesome in plant-houses and elsewhere, especially amongst soft-wooded cuttings or young seedlings; but they are somewhat eccentric as to food. In some places they will devour greedily a particular plant; and in others they may exist in quantities, and not even touch the same plant. They may also inhabit a house for a long period without making their presence known in any way except by their voice. They may be got rid of in the same way as Cockroaches. The following remedies may also be tried:—

Arsenic.—Mix some roasted Apple with a little white arsenic powdered; divide the Apple so prepared into small bits, and place it in saucers in the room at night.—Take 1 pint of oatmeal and 2 oz. of arsenic, together with a little ground Aniseed and Caraway-seed mixed with it. This should be laid on pieces of paper, in convenient places, for the Crickets to partake of it.—Also arsenic and honey may be mixed together, and laid about for them. Lay it in bits, about the size of a small French Bean, on the smooth side of oyster shells, pieces of glass, or broken glazed crockery; it is necessary to use something that has a hard smooth surface that will not absorb the moisture from it, or it will be so dry after the first night, as to render it useless. By using any of the above-named articles it will be fit for use for three nights. But this preparation must be used with caution, as domestic animals will eat it and be destroyed thereby. On the nights on which it is laid down exclude the garden cats from the houses, or these most useful animals will come to an untimely end. After being used for three nights the poison gets too dry for the Crickets to take it freely. By using it once in three months the insects will not do any serious harm; but where they have been allowed to get to such a head as we see them sometimes, it is necessary to keep laying down the poison every night for a fortnight or so, to bring them well under.

Carbolic Acid.—A little carbolic acid poured into their holes also puts them to flight.

Oatmeal.—Get a box with small holes in the top and sides; put some oatmeal and salt in it, and set the box at night in the room.

Rhubarb Leaves are said to be a cure for Crickets. A large bakehouse was some years ago infested with Crickets. As the hot weather came on the nuisance became very serious, for Crickets were to be found in every possible crevice. The baker was advised to lay some Rhubarb leaves about the place. The light of the next morning revealed nibbled leaves and myriads of dead Crickets; and this was the last of them in that bakehouse.

Water.—Take a dozen of old jam pots, half fill them with water, and at night place them in different parts of the room most infested.

Damp Walls.

The "Builder" gives the following remedy for damp walls:—Three-quarters of a pound of mottled soap to 1 gallon of water. This composition to be laid over the brick-work steadily and carefully with a large flat brush, so as not to form a froth or lather on the surface. The wash to remain twenty-four hours to become dry. Mix ½ lb. of alum with 4 gallons of water; leave it to stand for twenty-four hours, and then apply it in the same manner over the coating of soap. Let this be done in dry weather.

In the case of stone walls the following ingredients, melted and mixed together, and applied hot to the surface of stone, will prevent all damp from entering, and vegetable substance from growing upon it:—1½ lb. rosin, 1 lb. Russian tallow, 1 qt. linseed oil. This simple remedy has been proved upon a piece of very porous stone, made into the form of a basin, and two coats of this liquid being applied caused it to hold water as well as any earthenware vessel.

Dyeing.

Mosses, Grasses, and Everlasting Flowers may be most easily dyed by means of Judson's Simple Dyes. Dyeing with ordinary dye stuffs is a difficult matter, requiring more chemical experience and knowledge than is generally found amongst amateurs. Receipts for dyeing flowers are frequently given in gardening periodicals, but most of them are useless and impracticable. A list of receipts taken from the German has lately appeared in at least three gardening papers, which contain a series of colouring matters such as Munich lac (? lake) and mineral blue (there are a dozen mineral blues). A solution of borax is said to dye flowers orange, and in one receipt ¼ pint of ultramarine blue is ordered to be dissolved in 6 oz. of water, but for fear that the unfortunate amateur dyer should be puzzled how to dissolve ¼ pint of an insoluble pigment in so small a quantity of water, an explanation is added stating that ¼ pint means ½ drachm!

Earwigs.

Taking advantage of the fact that these insects feed in the night, almost any substance in which they can conceal themselves in the day may be employed to trap them. The usual practice of placing a small inverted flower-pot with a bit of Moss in the bottom, on the top of the stake to which the plant is tied, is not a bad means of catching them, provided the pots be regularly examined. Another trap commonly used is, small bundles of Bean-stalks tied up, cut 6 in. or 8 in. long, placed in each plant, and looked over daily by shaking the end of the bundle on a board or other substance, by which they can be destroyed. The most simple and effective traps are pieces of newspaper, crumpled roughly up in the hand, and stuck anywhere in the plants, unfolding them two or three times a week, when numbers of the insects will be found concealed in them. If there happens to have been bred a nest of young robins near the ground, the numbers of Earwigs they will eat, when they have taken flight and got old enough to find their own food will astonish anyone taking the trouble to watch their movements. In the case of Dahlias (and there is perhaps no flower to which they do so much harm as to the Dahlia), the use of thin muslin bags, in which the buds are placed before they expand, drawn up close round the stalk of the flower so as to prevent the insects getting to them, is also a method followed by some growers. A piece of cotton-wool, twisted round the flower-stem just behind the bud, will prevent them getting to the flowers. By resorting to some or all of these methods, their numbers can be so far kept under as to prevent the disappointment of finding all the best buds rendered useless. As preventives, the circular earthen pans that are made for the purpose, in the fashion of a collar to the plant, are very effective. They should be put down firmly and kept full of water, and nothing in the shape of a bridge should ever be allowed to make a way for the Earwigs to cross the water. Mulching is said by some to induce Earwigs, but this hardly seems reasonable, for whatever keeps the ground cool and moist acts as a preventive.

Food for Bees.

When honey-yielding flowers are scarce, Bees require to be fed artificially. The following mixture is used by some of our most successful bee-masters:—Add a gill and a half of water to half a gill of the best vinegar. Pour the mixture into a saucepan, add 2 lbs. of loaf sugar, and boil until it assumes a yellow colour; then pour into a well-greased dish, and cut up before it is cold into strips convenient for insertion into the hives. Should it candy on cooling, it is a proof that it has not been boiled enough, and should be returned to the saucepan without water, and boiled again. Mr. Tegetmeier omits the vinegar, and uses 1½ lb. of sugar to 1 pint of water.

Fumigation.

It is, under some circumstances, no easy matter to fumigate a house or pit effectually. Take a flower-pot 18 in. in diameter, which has previously had a hole made in the side about 1 in. or so above the bottom. In the bottom of the pot put a few red-hot cinders, and to ensure the ready ignition of the material employed for fumigating purposes, add a handful of dry brown paper torn into small pieces. When the brown paper commences to burn freely put a little dry Tobacco, or Tobacco paper, and then add in a gradual manner the properly-prepared material. The Tobacco paper, or rag, should be broken up into rather small pieces, and damped just sufficiently to prevent its burning too freely and bursting into a flame. As soon as the pot is filled and the material well ignited, it can be placed in the house, and with very little attention it will continue to give off dense clouds of smoke, until nearly the whole of the material is consumed. It is most essential the directions here given should be strictly followed; as, for example, if the Tobacco paper be used too dry it will burst into a flame, and the plants will be seriously injured; and if the damp material be put upon the cinders, it will not burn satisfactorily unless it is continually blown, and to remain in a house partly filled with smoke is not pleasant. The fumigating pot must be watched from the outside, and the material occasionally stirred and be lightly sprinkled with water, for the most disastrous results will follow if the material burns through and remains without attention for any length of time. The structures should, as a rule, be filled so that it is impossible to see more than 15 in. or so beyond the glass, and the fumigation should be repeated about two days afterwards. The evening is the best time for fumigating, and still weather should be taken advantage of. Remove all plants in bloom previous to the fumigation, as the flowers soon fall after exposure to the Tobacco smoke. The foliage must be perfectly dry at the time, but a thorough syringing is desirable in the morning following. In fumigating plants in small places, such as garden frames, there is always danger, as in such small space the smoke gets out before it has time to effectually kill the insects, necessitating a stronger application than the plants frequently can bear. Covering the lights with mats assists the retention of the smoke. Damp, mild evenings are the best for the operation.

Mr. Baines says :—" In fumigating large or small houses it should always be borne in mind that the nearer the plants are to the roof the more certain is the destruction of the insects, the smoke being the most dense near the top of the house; it will also be obvious that the closer the laps are in the glazing the more effectually will the smoke do its work; where the laps are open it is good practice to cover them with mats or any available material that will assist in confining the smoke. In the case of plants that will bear syringing overhead with clean water, it is well to give them a good washing the morning after; any of the insects that are nearly but not quite killed will receive the finishing stroke by this. Whatever material is used for fumigation—Tobacco, Tobacco-cloth, or paper—see that it is sufficiently moist to prevent its flaming, or it may do serious harm. The operator should, as a rule, stand outside till the house is sufficiently full of smoke to see that the material does not burst into flame, but simply smoulders. A good plan is to sprinkle a little damp Sphagnum over the material as soon as ignited; it cools the smoke and prevents flame. Care must also be taken, that whatever is used to ignite the fumigating material does not contain any deleterious gases likely to be injurious to vegetable life. Coal in a half-burnt state is liable to do much harm in this way. Wood-embers, charcoal, or a little coke are the best. The material should always burn quickly, throwing up a dense volume of smoke, so as to fill the house in as little time as possible; there is then less danger of drying the atmosphere of the house so as to be injurious to plant life. In the density of the smoke required to kill the insects, the operator must be guided by his knowledge of the strength of the material he is using, the size of the house, and the description of the plants it contains. The larger the house the less danger I have found of injuring its occupants by fumigation; consequently, such houses may be filled more densely with the smoke than plants in small houses will bear. The implements used for fumigating are various, from a garden-pot with a hole in the side to those mechanical contrivances that are frequently making their appearance, but which are more for sale than use. The fumigators which I have had in use for fourteen years, and which are the best I have seen, are made of strong sheet-iron riveted. They are 10 in. in diameter by 9 in. deep, on three legs 1½ in. high; the bottom and sides, half-way up, are perforated with holes one-eighth of an inch in diameter, 1 in. between the holes; they have stout handles, very similar to that of an ordinary saucepan. This is much better than a handle across the top, for if the material does not burn freely, the vessel can with greater convenience be swung repeatedly backward and forward, the draught quickly causing it to burn freely. I use one of these fumigators at each end of the house requiring smoking, by which means it is filled more rapidly."

Peach trees or Nectarines which are attacked with green fly may be fumigated on the open walls by procuring two poles long enough to reach from the top of the wall to the bottom, placing them one at each side of the tree, allowing them to rest against the top of the wall, and setting them 2 ft. away at the bottom; then get a carpet or blanket and lay over them, securing it well to the wall on each side, so that it will not allow the smoke to escape; the smoke may be blown underneath the bottom by means of a fumigator. The day after the tree has been fumigated it should be well syringed, and the ground dug underneath. One of the cheapest and most effective appliances for fumigating is a wire basket, 1 ft. sq. and 6 in. deep, with a strong wire from each corner to suspend it by. Into the bottom of this throw a handful of hot cinders, and over that another handful or two of charcoal. Then swing the basket about for a few minutes, and you will have a good red fire. The best Tobacco for fumigating is undoubtedly common Shag, which properly used is cheaper than most of the Tobacco-papers now offered to the public. In using this Tobacco, procure a handful or two of wet litter from the stable, and, chopping it into pieces about 1 in. long, mix it with the Tobacco as intimately as possible. Then place it on the fire, give the basket a swing or two in the air, and a volume of smoke will be evolved that will fill the house in a few seconds, and not only that, but, if the mixture be in a proper state of humidity, it will continue to burn for some time, and thus keep the house filled—a very important point in destroying thrips. Suspend the basket in the house, and the only further precaution necessary will be to watch and damp it should the Tobacco burst into flame. By these simple means fumigating is reduced to a minimum of trouble, and to fill half-a-dozen houses with Tobacco fumes in thirty or forty minutes is an easy task.

Fungi.

It is sometimes desirable to preserve specimens of Fungi for future or more convenient examination. For such purpose the following mixture has been recommended:—Sulphuric acid, 2 pints; water, 8 pints; mix and add creosote, 1 pint. Bottle the Fungi in this and cork tightly. It is said to preserve them perfectly without change of colour. Fungi may be preserved by drying, by bedding them in silver sand, gills upward, in tin boxes, and placing them in a slow oven for two or three hours. They may also be very well preserved in spirit if required, which preserves the colour; the preservation of this, is, however, generally quite unnecessary.

Glue and Flower Gum.

FLOWER GUM may be made by pounding white Shellac very fine, and mixing it with methylated spirit in a stone jar to a proper consistency, well shaking it up for half-an-hour, and placing it by the side of a fire to keep the bottle warm, and occasionally shaking it for about a day. Pure spirits of wine may be used. as it does not smell so strongly as that mixed with wood-naphtha. The former does not smell after it is dry, and is much cheaper than the others. The gum may be kept in any cool place and taken out as it is wanted, leaving the camel-hair brush in the gum. In gumming never fill the brush too full, and the petals should be gummed close to the tube.

GUM for fastening specimens on paper in herbaria may be made as follows:—Take two parts of Gum Arabic and one of brown sugar, and dissolve them in water to the consistency of cream. This mixture will be found far preferable to Gum Arabic alone. At the British Museum and Kew Gardens they use a mixture of Gum Arabic and Gum Tragacanth for this purpose.

DAMP-PROOF GLUE for fastening labels on preserve bottles may be made by soaking 5 parts of the best glue in 18 to 20 parts of water for a day, and to the liquid add 9 parts of sugar-candy and 3 parts of Gum Arabic. The mixture can be brushed upon paper while lukewarm; it keeps well, does not stick together, and when moistened adheres firmly to bottles. For the labels to be used in places subject to damp, it is well to prepare a paste of good flour and glue, to which linseed oil, varnish, and turpentine have been added, in the proportion of ½ oz. each to the pound. Labels prepared in the latter way do not fall off in damp places.

LIQUID GLUE may be prepared by dissolving 2 lbs. of the best pale glue in 1 quart of water in a covered vessel, placed in a water bath; when cool, add to it 7 oz. of commercial nitric acid; when cold put into bottles. This glue is very strong, and does not gelatinize in the cold. Marine glue is best bought ready prepared. It may be made as follows:—India rubber cut into small pieces with a wet knife, 1 oz., coal-tar naphtha (benzoli) 12 oz. Digest in a close vessel, shaking it frequently, to help the solution. When the rubber is dissolved, add 20 oz. of best Shellac, and continue the heat and stirring until perfect liquefaction has taken place, and pour the fused mass, while yet hot, on slabs of polished metal, marble, or stone. For use, it should be heated to its melting point, and applied with a brush very quickly. The thinnest possible coating should be used. Where large surfaces of wood are to be united, a thin piece of muslin should be interposed.

Gooseberry Caterpillar.

The locust-like appetite of this Caterpillar renders it most destructive to this useful fruit. As soon as they are observed means should at once be taken for their destruction, for if allowed to remain on the trees for only a few days, in addition to the injury they do, they are much more difficult to deal with. For some days after they first come to life they are comparatively tender and easy to kill. Anything of a dry, dusty nature they dislike; even dry road dust will render the leaves unpalatable to them, and cause them to drop off, but unless they are killed whilst on the ground they quickly crawl up the trees again.

Elder Leaves.—Boil a quantity of Elder leaves in as much water as will cover them until the liquid becomes quite black, then strain and cool it, and to every gallon of this liquid add 1 gallon of Tobacco-water. When the trees are quite dry apply it with a fine-rosed watering-pot, and in a few minutes the Caterpillars will fall off dead.

Foxglove Leaves.—Take a quantity of the stalks and leaves of the common Foxglove, bruise them, and throw them into a copper of boiling water, and let them simmer all night. The next morning the liquid will be the colour of porter. Its strength can be reduced by adding water. Strain through muslin or fine netting, and syringe with a very fine rose, if possible letting the liquid fall on the trees like dew. If no copper be handy, use a water-barrow; pour scalding water on the Foxglove, and cover up with sacks or mats.

Hellebore.—Take 1 oz. of Hellebore powder and 2 oz. of powdered alum; mix them thoroughly in a small quantity of water, and then add a gallon of water. Apply the mixture to the bushes affected, either by wetting them with a syringe or water-pot on the upper surface of the leaves; the Caterpillars will drop off soon after feeding upon the poisoned leaves. Hellebore powder will destroy these pests if dusted on them dry, but it cannot in this way be applied so regularly as when diluted. The principal use of the alum is to cause it to adhere to the leaves. One gallon is sufficient for from ten to twelve full-sized bushes; it is, therefore, by no means an expensive remedy. Many excellent authorities advocate the use of dry Hellebore powder, applied by means of a simple form of dredger made for the purpose. It consists of a cylinder of perforated tin 2½ in. in diameter, and 10 in. long; this has a fixed bottom, with a socket to receive the end of a handle of convenient length, and a brace to strengthen the socket; the cover fits sufficiently close to keep its place while in use. Any one living at a distance from a tinsmith could readily make a duster of this kind out of any old canister, and a wooden cover would answer as well as a tin one: care should be taken to get the Hellebore fresh, otherwise it is ineffectual. Hellebore is best applied when the leaves are wet; as, when dry, large portions of it get wasted. If obliged to apply the powder in dry weather, it is best to water the bushes first. A mixture of powdered white Hellebore and whitening may also be applied to the trees with an ordinary flour dredger, first thoroughly wetting the whole of the tree with the syringe to cause the powder to stick. The Hellebore, which should be freshly ground, as it loses its efficacy if kept long, is to be used in the proportion of 1 lb. to 6 lbs. of whitening, ground fine, and well mixed together; this will destroy every Caterpillar in a few days, even if they have grown large and strong. Hellebore being a poison, care must be taken that the whole is washed thoroughly off with the syringe or garden engine after the Caterpillars are killed.

Lime.—Air-slaked lime, if applied to the Caterpillars whilst they are young, will destroy them, but the trees should be examined shortly afterwards to see that none have escaped, more especially in rainy weather. In the winter, when the trees are at rest, put a spadeful of lime on the surface of the soil under each tree, spreading it out from the collar under the branches. This will kill the larvæ, which at this season are lying dormant under the soil, to which they have descended from the branches, after having completed the length of time they were destined by Nature to remain above ground, and from whence, if not destroyed, they will emerge and take wing, when the females will deposit their eggs on the trees, which in due course will hatch into Caterpillars.

Soot is said to be an excellent preventive if used in time. The best way to apply it is to lay a ring of soot on the ground round every Gooseberry tree close to the stem, and to the width of about 6 in. or 8 in. all round it.

Sulphide of Potassium.—Another excellent remedy is a dilute solution (one part in 500) of sulphide of potassium, the infected tree being sprinkled with this substance by means of a small hand syringe. This method has been successfully used on a large scale in Southern France.

Tobacco Powder.—Tobacco powder dredged over the bushes night and morning is as good a remedy as anything; while if the earth be trodden firmly down round the stems, the grubs will be unable to descend into it, and will become a more easy prey to their natural enemies.

Glass-cutting.

The following is an easy way of cutting glass bottles, carboys, &c., into handlights:—Pass five or six parts of coarse packing twine round the bottle on each side of where you want it divided, so as to form a groove about an eighth of an inch wide; in this groove pass one turn of a piece of hard-laid white line, and extend the two ends, and make them fast to some support; then have a tub of cold water close to and grasping the bottle by the neck with one hand, and the bottom with another, saw the bottle backwards and forwards for a short time; quickly you will soon smell heat from the bottle, caused by the friction of the hard cord. When after about one minute's friction, by a side motion of the bottle, throw it out of the line in the water, and then a tap against the side of the tub, the bottom will drop off. Carboys can be cut as easily, but, being larger, they require two persons to see-saw them backwards and forwards. The line of twine to form the groove must be put on quite tight, and then wetted to tighten more, so as not to shift; but let the groove and stout cord be dry. The cutting cord should not be less than an eighth of an inch thick, and the edge of the glass, after cutting, should be rubbed on a grindstone, as it is very sharp.

—— Another method of cutting glass vessels neatly is to heat a rod of iron to redness, and having filled the vessel the exact height you wish it to be cut with oil of any kind, proceed very gradually to dip the red-hot iron into the oil, which, heating all along the surface, the glass suddenly chips and cracks all round, when you can lift off the upper portion clean by the surface of the oil.

—— The bottoms of carboys and bottles can be cut off by making a slight nick with a file and then marking round with a streak of ink or water colour where you want it to come off. Make an iron red-hot and lay it on the nick. This will cause it to expand and crack, then by moving the rod round the crack will follow. When the carboys are rather large, it is better to have two rods heated, or while you are reheating the iron, the crack might take a transverse direction.

Grafting-clay, or Onguent de St. Fiacre.

This primitive composition consists of 2 parts of clay and 1 part of cow manure. It is held on the graft by means of packthread or a piece of rag, and presents the form of an oblong bark. Some persons put a strip of bark between the cut and the composition to prevent the latter from penetrating into the clefts. Others mix finely-chopped hay or Grass with it to give it more consistency. Two thousand years ago authors recommended the covering of the "kneaded luting and glue of the graft" either with a Borage leaf or with Moss. Grafting-clay is much used in many country places, and is an economical composition, especially for the grafting of all old trees.

Grafting-wax.

In grafting it is necessary to cover the wounds and cuts with an unctuous composition which will not have the effect of drying up or burning the wound, nor of running or cracking under the action of the air or from being badly made. This must be applied copiously and without stint to the wounds and clefts of both stock and scion when the graft is fixed in position. A well-executed graft may fail in consequence of the bad quality of the wax. Those modes of grafting in which no cut surface is exposed to the air, bud-grafting for instance, do not require any application of this kind. The composition of grafting-wax varies greatly, every grower having his own particular recipe, which he considers superior to all others. The base is usually Burgundy pitch, black pitch, bees'-wax, suet, and resin. To these ingredients some add ochre, hog's lard, flowers of sulphur, Venice turpentine, or sifted cinders. All are melted together over the fire in an iron pot, and the composition should be allowed to cool before it is used. Practice makes it easy to judge of the proper proportions of the ingredients; the pitch tends to thicken the composition, the suet to make it lighter, the resin imparts dryness to it, and the bees'-wax gives it oiliness.

—— The following mixture is held in very high repute at the horticultural establishments of MM. André Leroy, of Angers, and Baltet Frères, of Troyes:—First, melt together, resin 2 lb. 12 oz., Burgundy pitch 1 lb. 11 oz.; at the same time melt separately, suet 9 oz. Pour the suet, when thoroughly melted, into the first mixture, stirring it well while doing so; then add 18 oz. of red ochre, dropping it in gradually in small portions, and stirring the whole up for a long time. Whatever composition may be used it should always be unctuous, easily worked, and free from acridity, and is best applied lukewarm, rather cool than hot, and when of a consistency approaching the liquid rather than the solid. It is brought into this condition with the help of a small portable stove, heated like a warm bath, or with a spirit-lamp, or by any of the common methods. It is applied with a small paint-brush, or a stick with a rag wrapped round the end, or, better still, with a wooden spatula. The warm mastic is an economical kind for large operations, and is preferable to the cold mastic for autumn grafting, as the frost has been found to have less effect upon it.

—— The following is a simple recipe:—Melt together in a kettle 1 lb. of tallow, 1 lb. of bees'-wax, and 4 lb. of resin; then pour in a pail of water and pull it till well mixed.

—— Another good mixture is made of 3 parts of resin, 3 of bees'-wax, and 2 of tallow; but it is cheaper to use more resin, and a common mixture consists of 4 parts of resin, 2 parts of tallow, and 1 part of bees'-wax.

—— The inconveniences that always attend the use of warm compositions, and the trouble of making them, have brought very much into fashion cold mastics, which soften under the heat of the hands, or remain unctuous from the nature of their composition. Up to the present time no cold mastic can compete with that of M. Lhomme-Lefort, manufactured by his son at Belleville, Paris. This mastic is sold in tin boxes, in which it preserves its pliability, even after the box is opened. It is spread on the graft with a spatula, and should it be necessary to touch it with the fingers, these should first be wetted. Once exposed to the air, it hardens a little. It does not crack with frost nor run in hot weather, and is the best composition that can be used. We have seen in Germany a cold composition invented by M. Lucas, pomologist. This is made of Burgundy pitch melted over a slow fire. Into this is poured the third of its weight of alcohol of 90°, stirring the mixture constantly with a stick. The only drawback with cold mastics is that they do not harden sufficiently in winter when they are applied in autumn: then the frost, having an advantage over a soft substance, can reach the tissues of the tree thus insufficiently protected.

—— The following is a recipe for making Lefort's Liquid Grafting Wax, which is highly commended in France, where it was invented, and until lately kept secret. Melt 1 lb. of common resin over a gentle fire. Add to it 1 oz. of beef tallow and stir it well. Take it from the fire, let it cool down a little, and then mix 8 oz. of alcohol. The alcohol cools it down so rapidly that it will be necessary to put it again on the fire, stirring it constantly. Still the utmost care must be exercised to keep the alcohol from getting ignited. To avoid it, the best way is to remove the vessel from the fire when the lump that may have been formed commences melting again. This must be continued till it becomes a homogeneous mass, similar to honey. After a few days' exposure to the atmosphere it assumes a whitish colour, and becomes as hard as stone, being impervious to water or air.

Herbarium Insects.

Most Herbaria are infested with the larvæ of the Dermestes and other beetles which, if not checked, speedily reduce the specimens to a few pinches of dust. Various remedies have been tried, the most efficacious being corrosive sublimate and camphor. Some persons are in the habit of applying a solution of corrosive sublimate for the purpose of washing over their plants when mounted, and so preventing the development of animal life. The solution in use at the Kew Herbarium is composed of 1 lb. of corrosive sublimate and the same quantity of carbolic acid to four gallons of methylated spirit; this fulfils the purpose for which it is intended very well, but is somewhat disagreeable to use. At the British Museum it is found that the presence of camphor, frequently renewed in each cabinet, is sufficient to prevent the attacks of insects. It will soon be discovered that some plants, such, for example, as the Umbelliferæ and Grossulariaceæ, are peculiarly liable to such attacks; and these orders must be inspected from time to time, so that any insect ravages may at once be checked.

—— Dr. Rothrock, an American botanist, dissolves 1¾ oz. of corrosive sublimate in one pint of alcohol, to which he adds two-and-a-half fluid drams of carbolic acid, and applies the whole by means of a paint-brush. His own collection of 15,000 plants was treated with this preparation five years ago, since which time not a single insect has made its appearance. Damp is to be avoided in the situation of the Herbarium, as it favours the development not only of insects, but of mould, and renders the specimens rotten.

House Flies.

One of the most effective Fly poisons is made by dissolving 1 drachm of white arsenic in 1 pint of hot water. When cold sweeten the solution with brown sugar, treacle, or honey. The above is a dangerous composition, and should never be used where children or domestic animals can have access to it. The following are quite safe, but not so killing:—Quassia chips, ¼ oz.; water, 1 pint; boil for ten minutes, and add 4 oz. of treacle. Flies will drink this with avidity, and are soon destroyed by it. Another good mixture is made by adding a teaspoonful of finely-powdered black pepper and two teaspoonfuls of brown sugar to four teaspoonfuls of cream. It is a fact not generally known that Flies will not pass through a netting made of fine silk wire, although the meshes are many times larger than the body of the Fly, except there is a window behind it. The cafés in Rome and Naples are kept quite free from Flies in the summer by means of such a netting hung before the door. White tape dipped in sugar and water, say 2 oz. to the pint, and suspended in festoons from the ceiling, make an excellent Fly-trap, and is almost better than Fly poisons, for it generally happens that every Fly that is killed has half a dozen relations, who come from outside to weep over his corpse. Papier Mouré is bibulous paper, soaked in a solution of cyanide of potassium. This is also a dangerous preparation.

Insects in General.

Although the principal insect-pests which trouble the farmer and gardener are treated of under their particular headings, it may be useful to say a few words on insects generally, and the best means of destroying them. Preventive measures are, it need scarcely be said, the best weapons in the gardener's armoury, towards the beginning of the month of February, or even earlier if the winter be a mild one, in order to prevent future mischief and assure the gardener that anything he does in the early part of the year is like nipping a disease in the bud, and a hundred times more valuable than anything he can do at a later period when his enemies, if more apparent, are more numerous and more rampant. In digging, he will meet occasionally with brown, long, barrel-shaped chrysalids in the earth, from ½ in. to 1 in. in length. These he may safely treat as enemies. It will also repay him well to turn up with a fork the earth and Moss at the roots of any trees in the neighbourhood of the garden in quest of chrysalids. Let him also search in outhouses and sheltered corners for those chrysalids which do not hybernate in the ground. We strongly advise the young gardener to put any he may find aside in a place where he can see them come out, not so much to make him an adept in entomology, but that he may learn at least the principal forms that come out of the different chrysalids. If he pin a sample or two neatly and put them away in a box or drawer, he will find that the knowledge thereby acquired will not be thrown away. In the chinks of trees—especially fruit trees—many nascent evils now lie hidden in the form of eggs, and in orchards where fruit suffers much from that kind of vermin this is the time to go over the branches with a nail-brush and Gishurst soap and water. There is a capital kind of nail-brush now made of Palm fibre (3d. each), strong and durable, with which the gardener would do well to provide himself. In the early part of the year, too, he ought to look over his fruit and other trees for indications of the various blights, and many a hidden foe may be discovered by cutting across a suspicious-looking twig or branchlet, when the beautiful yellow-spotted caterpillar of the leopard moth, the large claret-coloured caterpillar of the goat moth, &c., may be met with in their wonderful tunnels. With regard to insects in stoves and greenhouses there seems great reason to believe that insect and parasitical attacks are, with a few exceptions, a consequence of ill-health arising from some other cause; keep up the vital energy, therefore, by thorough ventilation, full exposure to light, a moderate temperature, judicious watering and mulching, and you will effect more than all the scrubbing and painting in the world. Amongst the natural checks to the increase of insects, birds of all kinds must be placed foremost; the gun should therefore be used with moderation. Chickens, ducks, and seagulls have been allowed to run loose in orchards and gardens with excellent effects. The common toad, too, is a voracious feeder on insects, as well as snakes, wasps, and spiders. One of the most potent natural enemies of insects is the dried and powdered flower-heads of the Pyrethrum roseum and P. carneum, sold under the name of Persian Insect Powder, Insecticide Vicat, Dumont's Insect Powder, &c. The specific property lies in the pollen, and it is according to the proportionate amount of it that may be in the powder that it is more or less effective. The manner of using it is to scatter the powder about the roots and over the leaves of the plants affected. It has the effect of causing the insects to fall down as if dead or asleep, even bees and wasps succumbing under its action; the larger insects, however, by-and-by recover as if coming out of a swoon, the smaller never come out of it. The commercial insect powder is very liable to failure, being adulterated with sawdust or the dried and powdered flowers of some of the Anthemidæ, but a powder prepared as follows from the Pyrethrum roseum is most effective against moths, fleas, bed bugs, poultry vermin, and other insect plagues. Seeds of the Pyrethrum, which are obtainable from large seed dealers, are to be sown in May, not too thickly, in a well-cultivated bed, and, if the weeds be kept down, will develop into strong plants by the autumn, although they seldom bloom before the next May or June. The flowers are to be plucked as they become fully developed, and the yellow disc-flowers separated from the red ray-florets, thoroughly dried in the shade, and finely pulverised. Flowers can be plucked even in the autumn, so that a few plants will produce a considerable quantity of the powder. As the plant is perennial it can be propagated by division, and since it is indigenous to the Caucasus, it is not damaged by a low winter temperature. There are other powders which are also destructive to insects, but not to the same extent as P. carneum and P. roseum. The true kind made from P. roseum or P. carneum is rarely to be met with at all. It is not difficult to distinguish between powder made from these species and powder made of other Anthemidæ, provided they are both genuine, and composed of the pollen in which the virtue chiefly resides. Under the microscope the pollen spores of Pyrethrum roseum, for example, have needle-like projections, while those of the Anthemidæ have been rounded: but the fact is, in the majority of samples no spores of pollen are to be seen at all. Mr. Andrew Murray has examined a number for the purpose of endeavouring to determine from what species the powder has been manufactured, but he failed in discovering it. In no instance did he find any pollen at all—nothing but broken fragments of epidermis, of leaf, flower, or branch. Another test is the scent. Good powder has no scent, and the colour should be a dull, dirty drab.

—— Poke Root (Phytolacca decandra) is also destructive to insects. Dr. F. C. Renner, of Frederick County, Maryland, writes to the Department of Agriculture at Washington, that several years ago he collected some Poke Root for medicinal purposes, and placed it in various parts of the house to dry. After several days he observed that there were many Cockroaches lying dead, and upon examination he found they had partaken freely of the Poke Root. Some of the Root was placed near their haunts, and the result was that it rid the premises of those insects.

—— According to M. Charles Baltet, the celebrated fruit-grower of Troyes, the Eucalyptus is a most efficient insectifuge. In a letter to the "Illustration Horticole" M. Baltet says:—"Lately my brother-in-law, Captain Mignard, being very much disturbed in his sleep by Mosquitoes, took it into his head to place a young plant of Eucalyptus in his bed-room over night. From that moment the insects disappeared, and he slept in comfort. I have been following his example with the same result. Should this really prove generally efficacious, our southern provinces will be freed of one scourge. People will use young plants of Eucalyptus instead of Mosquito curtains." A few Tomato plants trained across the windows will also have the same effect.

Labels.

Few labels are better than those made of zinc, provided their oily surfaces are carefully cleaned with fine emery paper before writing upon them. Their permanency, however, may be very much extended by warming the label after it is written, and rubbing it over with a paraffin candle. This protection to the writing is found to be very effective. It is a good plan to coat the label with white hard spirit varnish, as the photographers do their negatives. The label should be heated till it is just too hot to touch. Muriatic acid may also be used for cleaning the zinc, but emery paper is handier. The following is a good formula for ink for writing on zinc labels:—Take of verdigris and sal ammoniac each 2 drachms, lamp-black 1 drachm, water 4 oz., to be well mixed in a mortar, adding the water gradually. It must be kept in a glass-stoppered vial. Write on the zinc with the ink, after shaking it well, with a quill pen. When once dry the writing may be exposed to the weather or buried in the ground, and it will be as legible as when first written.

—— The following method of preserving wooden labels that are to be used on trees or in exposed places is recommended in a German paper. Thoroughly soak the pieces of wood in a strong solution of copperas (sulphate of iron), then lay them, after they are dry, in lime water. This causes the formation of sulphate of lime, a very insoluble salt (gypsum) in the wood. The rapid destruction of labels by the weather is thus prevented. Bast, mats, twine, and other substances used in tying up or covering trees and plants, when treated in the same manner, are similarly preserved. At a recent meeting of a horticultural society in Berlin, wooden labels thus treated were shown which had been constantly exposed to the weather during two years without being affected thereby.

—— Excellent labels for trees and shrubs may also be made by stamping the name on pieces of soft sheet-lead. If firmly fastened to the tree when planted they will last for an indefinite period, and, practically speaking, they are indestructible.

—— A method of marking labels invented by Mr. Green, late gardener to Mr. Wilson Saunders at Reigate, has much to recommend it. A small T-shaped cast-iron label is used. It is first painted white, and allowed to dry thoroughly, and then painted black. When the black paint has skinned over, the name of the plant is written with a fine but round-pointed bit of iron, thus exposing the white surface below. In this way effective lettering is produced, and the labels being black are not at all so offensive to the eye as whitened ones.

Liquid Manures.

Liquid manures as a rule, especially among amateurs, do not receive the attention they deserve. All experience leads to the conclusion, that manure, of whatever description, is the quickest in its action when applied in a liquid state, consequently, when any crop gives evidence of an insufficiency of support, there is nothing so effectual as liquid manure; this particularly applies to kitchen-garden crops, where the necessary application is practicable. In fact, there are some vegetables that, in their more advanced stages of growth, can only be brought to perfection by the use of liquid manure judiciously applied. The French summer salads that are held in equal estimation with those they produce in winter, owe their excellence largely to the rich liquid with which they are unstintingly supplied. Lettuces, Radishes, and even Mustard and Cress, that are grown quickly by the use of liquid manure, are as different as can well be imagined from the tough, flavourless, indigestible material of which an English salad is too often composed. The comparatively large plants in the smallest of pots, unsurpassed in their way, which the growers for Covent Garden Market turn out, are striking examples of what may be accomplished by means of liquid manure alone. Liquid manure is also used with excellent effect for Pine-apples, Cucumbers, fruit trees of all kinds in pots, in short, for all plants in pots that require stimulating.

Gas Liquor.—The ammoniacal liquor obtained from gas-works may be used with excellent results in places where its peculiar odour does not render it objectionable. It consists of a solution of ammoniacal salts which constitute its principal value, and a number of other compounds which, if they do no good do little harm. It is very caustic, and must be diluted with at least six times its bulk of plain water. Even then it must be applied cautiously to delicate plants, otherwise they will become burnt up. If much of it be used, sulphuric acid (oil of vitriol) should be added, in the proportion of a quarter of a pound to every gallon, to fix the ammonia. The diluted solution forms an excellent manure for Grass, to which it may be applied in the proportion of 100 to 200 gallons per acre.

Guano.—Dissolve 50 lb. weight in 10 gallons of water, and of this strong solution add ¼ pint to every 10 gallons of water.

Mineral Liquid Manure.—A solution of sulphate of ammonia, a quarter of an ounce to the gallon, is much recommended.

M. J. Jeannel, an eminent French agricultural chemist, recommends the following formula, but it does not seem to have worked so successfully in other people's hands as in his own. The manure consists of the following:—

Nitrate of ammonia	400 parts.
Nitrate of potassa	250 „
Biphosphate of ammonia	200 „
Chloride of ammonium	50 „
Sulphate of lime (gypsum)	60 „
Sulphate of iron	40 „
	1000

The salts should be pulverised separately, and then thoroughly mixed. This manure is applied in the following manner:—Dissolve 62 grains in a litre (1¾ pint) of water; give to the plants, according to their state of development, every week from 387½ to 975 grains of this solution (equal to from 1½ to 9 grains of the salt in solid state).

Solution of Cow Manure.—One part by weight of cow manure mixed with four parts of tepid water, of which 1 pint weighs 1¼ lbs., forms an excellent liquid for watering Vines, Peaches, standard Apple and other fruit trees, and for strong-growing vegetables such as Cucumbers, Celery, Cabbage, &c.

Solution of Sheep-Droppings.—The proportions in this case are 1 peck of fresh manure to 30 gallons of water. The mixture should be well stirred, but allowed to settle before using.

Solution of Soot.—A liquid manure formed by adding 6 quarts of soot to a hogshead of water, is very serviceable for watering stove plants, Pines, Vines, forced plants generally, as well as most bulbs and flowering plants and shrubs.

Mealy Bug.

Mealy Bug (Coccus Adonidum) is one of the worst enemies with which the cultivator of stove plants has to wage a warfare. It multiplies so rapidly, and is so tenacious of life, that unless the utmost vigilance be exercised and remedial measures resorted to, it will soon spread over a house of plants, and do considerable injury. The Mealy Bug resembles small tufts of white cotton wool, and is exceedingly troublesome when it finds its way to Grape Vines, for if allowed to spread—and it is no easy matter to hold it in check—it will render the crop quite worthless. The insect will live through the winter on greenhouse plants; but here it increases so slowly and spreads so little, that it does not do much harm, further than that when stove and greenhouse plants are mixed for decorative purposes, there is danger of the bugs getting from any infested greenhouse plants that happen to come in contact with the occupants of the stove. The worst circumstance connected with Mealy Bug is, that it does not alone exist upon plants, but it gets into the woodwork, under the lights, cracks, and joints, into the rafters, and even the brickwork; consequently, if all the plants in a house infested with it were thoroughly cleaned or destroyed, it would be sure to make its appearance on any fresh ones that were introduced into it. It will also live upon almost any description of plant grown in heat in the summer season, or, even in winter where much heat is used. It increases very fast, and, if left unmolested, to such an extent as to virtually smother the plants; its excrement coating over the surface of the leaves, clogging up the pores almost as completely as if they had received a coat of varnish. Mealy Bug is, by far, the most difficult insect to thoroughly eradicate where once it gets established; and there is no possibility of its complete destruction, except by persistent action, until every trace of it disappears.

On Cucumbers and Melons.—Upon Cucumbers and Melons Mealy Bugs thrive apace, and the plants will not stand any dressing sufficiently strong to kill them. It sometimes happens that plants affected cannot for a time be spared; then it becomes necessary to keep the insects as well under as possible with the sponge and syringe, using clean tepid water; but wherever the plants can be dispensed with, the best plan is to destroy them, giving the house a thorough cleaning before starting a fresh lot.

On Figs.—In the Fig-house they are more difficult to deal with, as the young fruit are liable to drop off through the application of any dressing that will kill the insects, yet there are not so many hiding-places on the bark of Figs as upon Vines. As soon as the leaves are off give three dressings with Abyssinian Mixture, using it at 4 oz. to the gallon. If this be carefully applied it will effectually destroy the Bugs. The house must undergo a similar cleansing to that recommended for Vineries.

On Pine-apples.—It is so difficult to eradicate Mealy Bug from Pine-apples that some growers burn the infected stock, and after the house has been thoroughly cleaned, painted, and whitewashed, make a new beginning with suckers obtained from a perfectly clean stock.

The following remedy may be used in mild cases;—Boil 1 lb. of Tobacco in a gallon or two of water for an hour or so, and when settled pour off the liquor; melt 1 lb. of soft soap and 1 lb. of size or glue in warm water; take 1 lb. of flowers of sulphur, make it into a paste with the soap and glue, so that it will easily mix with water afterwards; add to it 1 gill of turpentine; mix the whole well in a tub containing about 12 gallons of water, at a temperature of 125° to 130°; stir it well about, and continue stirring; then take the Pine plants and syringe them with the liquid, seeing that every plant and every axil are thoroughly washed and wetted. Let them drain into a tub, and set them aside top downwards to drip and dry. In a day or two syringe them again with clear water at 120°; drain again, and when dry plunge in a genial bottom-heat, after having renewed the beds, and whitewashed and painted, and thoroughly cleaned the house. These directions are for plants in pots.

On Stephanotis.—It is difficult to completely eradicate Mealy Bug when once it has got established, but with perseverance it can, nevertheless, be accomplished; and it is more easily destroyed on Stephanotis than on most other plants, owing to its being able to bear, without injury, an application of insecticide sufficiently strong to kill the insects. Remove the plant from the wires, and immerse its head in Stevenson's "Abyssinian Mixture," 8 oz. to the gallon; repeat this two or three times in the course of a fortnight. Paint the house thoroughly; limewash the walls; remove the surface-soil from the beds, if any; also tan, or other plunging material; in short, leave no lurking places in which the insects or their eggs can find a lodgment. Dip and wash all plants in the insecticide repeatedly, as recommended for this insect. This, if carried out, will effect its complete destruction.

On Stove Plants.—In the case of Stove Plants, almost the only course that can be taken is to overhaul them, and wash away every cluster of the pest with the aid of a small hard brush, water, and soft soap. This must be done several times in the course of the year, in fact, as often as may be necessary. Mr. Jordon, of St. Louis, says in the "Gardeners' Monthly," that he has removed these pests from thousands of the most delicate stove plants without injury to the latter, simply by applying frequently for a few weeks spirits of wine diluted with 5 per cent. of water. The most convenient equipment, he thinks, is a fine brush put through the cork of a wide-mouthed bottle. By using camphorated spirits reduced with water, the most delicate-foliaged stove plants may be operated on without injury. It, however, requires careful and frequent attention to get rid of this pest, and the mixture is best used with a soft brush or a small piece of sponge tied to the end of a stick and washed on as softly as possible.

On Vines.—Grape Vines infested with Mealy Bug must be frequently examined when they are in full growth, and the clusters of the pest be brushed away. At the winter-pruning well wash every particle of the wood, and then dress it with a mixture prepared as follows:—To 10 quarts of water add Tobacco ½ lb., sulphur 1 lb., soft soap 1 lb., and a table-spoonful of spirits of turpentine. To properly mix the several ingredients, boil first of all the Tobacco for twenty minutes in about three quarts of water; then with a little of this water, whilst quite hot, work the turpentine, sulphur, and soft soap into a paste, and when they have been well mixed pour gradually upon it the remainder of the boiling water, and finally add sufficient clear water to make ten quarts in all. The Vines must be painted all over with this mixture, and sufficient care taken to avoid rubbing or in any way injuring the buds. Those who may be anxious to save the trouble of preparing the above mixture can dress the Vines with Gishurst Compound, in the proportion of 8 oz. to the gallon of water, with sufficient clay added to make it of the consistency of paint. To amateurs with but little time on their hands the mixture of Gishurst can be strongly recommended.

—— Another remedy is to fumigate the plants when they are dry for several nights running, and next morning syringe over and under the leaves with soot-water, holding 1 lb. of size in solution in four gallons of water. For strong, hard-wooded plants use a size solution, containing 1 lb. of size to the gallon of water, and daub the Bug with a brush wherever it shows itself.

Mildew on Grapes.

This is certainly one of the most troublesome and destructive diseases with which the Grape grower has to contend, inasmuch, as if once established, the crop, however fine, is doomed to destruction, for, although mildew may in a great measure be prevented, it cannot be cured. It generally appears first on the young foliage in the form of small white specks, but may frequently be seen on the young berries, when it has not been discernible on the foliage. Vines that are in bad condition are more liable to its attacks than those in a sound and healthy state; therefore, if we would effectually ward off mildew we must have healthy Vines. Some varieties of Grapes are much more susceptible than others, and it often happens in mixed houses that one or more varieties may be affected by it, whilst others growing close by the side of them may be entirely free. Mildew on Grapes is most prevalent in cold, damp, sunless seasons, when air cannot be freely admitted especially so in Vineries that are unheated and kept in a moist condition, for mildew being a fungus, delights in a cool, moist atmosphere, and under such circumstances the rapidity with which it spreads is alarming, therefore in all Vineries there should be some means of keeping a warm, dry atmosphere during cold, damp weather. Mildew has been attributed to numerous causes, such as stagnant atmosphere, unhealthy root-action, insufficient ventilation, sudden checks, dryness at the roots, &c. And although we admit these are all more or less favourable to the rapid progress of the disease after it has once made its appearance, yet the direct cause has never yet been plainly pointed out, and we very much question if it be possible. It frequently happens that Grapes that have been subjected to the best known modes of treatment are affected with mildew. Supposing that every precaution has been taken with regard to watering, ventilating, heating, &c., in what direction are we to look for the cause? That it is most prevalent during cold, cloudy weather most people are pretty well agreed. May not, then, the principal cause be sudden draughts of cold air upon the tender tissues of the berries and foliage produced by the sudden opening of doors, &c.? It has frequently been noticed in ranges of Vineries that those houses most affected by mildew were those communicating with the open air, whilst those that were accessible by other means were not affected in the least. Lady Downe's Seedling, Black Alicante, and Black Hamburgh are varieties much more liable to mildew than many others, especially those of the Muscat type. The only effectual preventive for the spreading of mildew is sulphur, and it may be either mixed with water and applied in a liquid to the Vines by means of a syringe, or mixed with milk to the consistency of paint, and applied to the hot-water pipes or flues with a brush. The latter is most effectual if the pipes be made hot and the house kept close, but it is more dangerous than the former, as if slightly over-heated rust is the result, therefore it should never be used in this way by the inexperienced. In whatever way it may be applied it should be done directly the disease is discovered in order to arrest its progress, as the vitality of the skin of the berry once lost can never be restored; prevention, then, is the principal thing to be aimed at. Berries that are affected by mildew are useless, as the skin becomes contracted and causes them to become unshapely, and they never ripen properly; they should therefore be removed as soon as possible to prevent the further progress of the disease. Vines that have been much affected by mildew when pruned should be well dressed with sulphur, soft soap, and soot, adding a little clay to thicken it. This being done will diminish the chances of its returning the following season.

Mr. J. Simpson, while admitting that "Mildew is one of the worst diseases that affect the Vine, states that fortunately it does not very often attack Vines grown under glass in this country, and adds that good culture and attention will generally ward it off, but that when once established upon the plants, it is most destructive in its effects. It is generally the result of unhealthy root-action, a too low temperature when the Vines are in full growth (thereby predisposing them to the disease), a stagnant atmosphere, insufficient ventilation, or, in fact, anything which lowers the vitality of the Vine when it is growing. Intelligent treatment therefore is the best preventive. The disease should always be watched for, however, as preventive measures, when it does occur, are only successful when taken early. It first makes its appearance upon the surface of the leaves, in the form of small, white, dusty-looking specks, just indicating that the parasite has taken hold; but it will often spread over a whole house of Vines before its presence is noticed or even suspected, and if not checked it runs over the leaves with marvellous rapidity, killing the tissue wherever it establishes itself; eventually it reaches the berries, covering them as with a white hoar, destroying their skins as it does the tissue of the leaves, and utterly spoiling the crop and seriously injuring the health of the Vines. It can only be checked when it does appear by timely action, and sulphur is the only remedy. The sulphur should first be mixed with a small quantity of milk until it is thoroughly disintegrated, then poured into a pitcher of water, and applied to the Vine with a syringe until every leaf is wetted. This will seldom fail to destroy the parasite, though it may have to be applied more than once. In winter the Vines should be washed, and afterwards painted with sulphur and milk."

Mildew on Roses.

One of the most prevalent diseases to which the Rose is subject is mildew, which is often very destructive to young Roses in the seedling state. It also attacks plants when fully grown, particularly in dry soils and during dry seasons. The best way of preventing it is to cut away all weak shoots and those that have already flowered, taking care of those that are strong and not likely to make laterals in the autumn. If this be impracticable, the mildew should be immediately washed off with a sponge dipped in a mixture made with 3 oz. or 4 oz. of soft soap to a gallon of water. This is quite as effectual as sulphur, and leaves no marks. The soft soap should always be dissolved in cold water.

—— Syringing towards evening and then dusting with flowers of sulphur is also recommended. Where this is objectionable on the score of appearance, sulphur may be applied in the dry state during the day while the leaves are dry. Watering with a solution of nitre is also said to destroy mildew. In open and well-exposed situations the disease seldom occurs, but in pent-up and shady places it is almost certain to make its appearance, and will spread like wildfire if not daily looked after.

Millipedes.

The horticulturist must regard Centipedes as friends, but not so the Snake Millipedes or Juli. These are general feeders, consuming both living and dead, and decaying animal and vegetable substances. The living animal matter on which they prey consists of slugs, small snails, earth-worms, insects, and their larvæ and pupæ, and in that respect they may be regarded as friendly to the cultivator; but, on the other hand, they also feed on living plants, and many of them, such as Potatoes, Carrots, &c., are often seriously injured by the attacks on their roots. A sound healthy tuber has perhaps too tough a coat for them to penetrate, but when they get into the juicy interior of soft pulpy roots, such as bulbs, the case is different; they can have no difficulty in making their way into them or in consuming the tender fibres of the roots of herbaceous plants. It is very doubtful whether any means have been found of getting rid of these pests. Sprinkling soot and nitrate of soda over the land, and watering it with lime-water, have been recommended, but apparently without much success. It is difficult to damage the insect without damaging the plant attacked. So far as greenhouses, hothouses, and outhouses are concerned, they may be kept tolerably free from them by care and cleanliness; but the open fields are less under control. The commonest species are the Julus terrestris, a leaden-coloured kind, something like a thickish wire, and Julus guttatus, a small, long, thread-like species, too minute and slender to allow anything to be done by direct manipulation. When viewed under a magnifying glass this last species will be seen to be a very pretty little animal, like a pale thread about the thickness of a pin, with a double row of bright crimson spots upon it, and when put in spirits it stains the liquid of a purple hue, to which it itself turns after death. It has no eyes, which has led to its being regarded as belonging to another genus. This is the species which most frequently forces itself upon the attention of horticulturists, and Lilies seem especially the objects of its attacks. Curtis, from his own knowledge, specifies the roots of the Scarlet Runner, the roots of the Cabbage tribe generally, and the roots of young Wheat, as having been attacked; and Mr. Wilson Saunders notes that he had observed that the young roots of his Heart's-ease were injured by this species. There are several other British species of Julus, viz., J. Londinensis, J. latestriatus, J. punctatus, and J. pilosus, and with them should be reckoned the little flat Polydesmus complanatus, which seems to be not far behind J. guttatus in its mischievous propensities. Millipedes are often popularly, but very erroneously, called Wireworms. The Wireworm is the larva of one of the Elateridæ or Skipjack Beetles; the Millipede is not an insect at all, insects proper only having six legs.

Mole Crickets.

These pests, which are much greater enemies to the cultivator in France than in this country, are probably often the cause of much damage to many subjects without the destroyer being suspected. M. Souchet has several fields planted with Gladioli, and the moment a trace of the Mole Cricket is seen, a workman follows up the run with his finger till the spot where it rests is arrived at, and then the hole is made wide at top, and immediately afterwards filled with water to the brim. On the top of the water they then pour a little oil, which gradually descends with the water, and closing up the breathing tubes of the mischievous little brute, it begins to perish of asphyxia, and generally comes out and dies on the surface of the earth. M. Souchet is so impressed with the necessity of destroying this pest that even his unoccupied land is rolled quite flat, so that the tracks of the insect may be seen at a glance, which could not so readily be discovered in rough cloddy soil; and when its presence is shown by decayed plants in the thickly planted beds of Gladioli, and its run cannot be traced, the ground is trodden quite firm and smooth between the rows, so that its little pathway can be readily seen. Two jars (one full of water and the other of oil) are always kept at hand. Of course the insect may be dug out if the land be unoccupied, but the water and few drops of oil on its surface is the quickest and surest plan of destruction, and, in planted beds, the only practicable one. M. Boutard Ruel, of Mer, destroys them by means of soapy water poured into their holes. To prepare the solution, boil, during a quarter of an hour, 18 oz. of common soap in 30 quarts of water.

Mortar for Garden Walls.

To obtain good mortar, as much depends on the character of the ingredients and the manner of mixing them as on the goodness of the lime itself; it does not necessarily follow that because the lime is good the quality of the mortar will be good also. The best lime ever burnt would be spoilt by the custom, common among builders, of mixing with it alluvial soil and rubbish taken from the foundation pits of intended buildings. The sand should be hard, sharp, gritty, and not too fine; it should be perfectly free from all organic matter, and with no particular smell. Good sand for mortar may be rubbed between the hands without soiling them. The water should be free from organic matter, and should never be taken from stagnant ponds. Bits of stick, straw, or other vegetable matter will cause the mortar to "blow out" in small flakes after it has set. Salt in either the sand or the water appears to have but little effect on the ultimate strength of mortar, but it causes the work to saltpetre, as it is termed, white feathery crystalline spots appearing on the face of the structure. It need hardly be mentioned that mortar made with salt or sea-water remains damp for a very long period. The object of the sand is to increase the resistance of the mortar to crushing, to lessen the amount of shrinking, and to reduce the bulk of the more costly material—lime. Water is the agent by which the combination is effected, and no more of it should be used than is absolutely necessary to fill the insertions between the grains of sand, and render the whole into a paste sufficiently thin to be easily spread on a flat surface without running over or squeezing out under the weight of the superincumbent brickwork. For heavy rubble-work take 1 part of slaked lime, 2 parts of sand, and ⅓ part of smithy ashes: for brickwork, 1 part of lime, 1 of sand, and 1 of smithy ashes.

Moss.

On Fruit Trees.—This is generally an indication of approaching decrepitude, removable in the case of young trees, whose growth may be improved under more liberal treatment, but not so on old ones, upon which, however, the Moss does but little harm, except indeed in the way of harbouring insects. Various remedies have been suggested, such as carbolic acid and chamber lye, a solution of ½ lb. of common salt or washing soda in 1 gallon of water, and milk of lime laid on with a brush. The true remedy, however, appears to lie in thoroughly draining and enriching the ground in the neighbourhood of the trees so as to induce a more healthy growth.

On Walks and Lawns.—This generally arises from the ground not being properly drained, for Moss never grows on lawns that are drained sufficiently. The surface soil should be enriched with a dressing of soot, wood-ashes, nitrate of soda, or even lime; the turf itself should be improved either by relaying the parts that are most mossy, or by sowing down with good seed. As a beginning it is well to try a sprinkling of fresh lime on the first dry day in March, and about the end of the month spread on the lawn a thin film of guano, nitrate of soda, or some other fertilizer. For large lawns the following treatment has been successfully adopted:—In early spring, while the ground is wet or soft, rake it with a long, sharp-toothed rake, working it well backwards and forwards in order to bring the Moss to the surface and disturb the remainder considerably. Clear away the Moss so brought up, and leave the ground untouched for a fortnight. Early in March repeat the operation; and about the middle of that month apply a dressing of rich compost, which may consist of any old rubbish well decomposed, adding one-sixth of fresh lime. Mix the lime with the compost a few days prior to spreading it over the ground. Cover it with the compost. Spread this on the ground at the rate of 200 barrow-loads per acre, passing it through a ¾-in. sieve, to save the trouble of stone-picking. Rake it evenly over the surface with a wooden rake, and, when dry, sow Festuca ovina, 6 lb.; Festuca duriuscula, 3 lb., or 6 lb. if the Grass is to be mown with a machine; Cynosurus cristatus, 6 lb., and Trifolium repens and T. minus, 3 lb. each, omitting the last if the ground be of a wet nature. If the situation be shaded by trees, sow 3 lb. of Poa nemoralis instead of Festuca ovina. The above quantities are sufficient to renovate an acre. After sowing, the ground may be lightly raked and then well rolled, and twice weekly. In the month of May a dressing with soot in damp weather would do much towards ridding the lawn of the Moss. The cause is a poor soil with a damp bottom; the remedy, an improved state of the soil and more herbage. Wood-ashes are good, also salt; but it takes nearly as much salt to kill Moss as it does to destroy Grass. By proceeding as above recommended you will not be able to use the ground so early, but you will be well satisfied with the improvement in the appearance of the lawn. For walks the following remedies are suggested:—Mix in a 3-gallon watering-can 20 pints of water and 1 lb. of oil of vitriol; stir it well, and water the middle of the walks, so that 12 yards may be covered by it. If the edging be approached, it should only be by what runs from the walks. The best way to use it economically is to water from the centre to the side literally along the walk; in two or three days Moss and Grass will have disappeared. This and the following remedy are, of course, inapplicable to lawns. An old watering pot should be used, and should be well washed out immediately after, otherwise the vitriol will act on the metal and produce holes in the can. Salt may be also used, care being taken to avoid its spreading so as to injure the turf. A good plan to prevent its being washed to the sides of the walk is to place a small ridge of sand along either side, about 6 in. from the edging, for a few days until the danger is past. The salt may be applied in a dry state, or with boiling water, which is the quickest. Whatever you apply to kill the weeds is liable to be washed by the rain to the sides, and so may destroy the turf. Hand-picking is therefore safest.

Mushroom Spawn.

Mushroom spawn should if possible be made early in the spring, as by so doing a sufficient quantity of cow manure—which is the principal ingredient employed—can be collected together from the cow-sheds before the cows have any green food, as the manure is much stiffer and answers the purpose better than when Grass is their principal food. This should be laid in an open shed to dry, and moved every few days to prevent it heating; to this should be added in equal proportions fresh horse-droppings, a little loam, and some chopped hay or straw. The whole should be well worked together and then trodden down, after which it may be allowed to remain for a few days, when it will require to be turned two or three times a week. If the weather be fine and dry the mass will soon be in a fit condition for moulding into bricks, which process can be performed by using a mould in the same way as the brickmakers, or it may be done in a more simple manner, viz., the manure should be spread to a thickness of 6 in. and then be firmly trodden and beaten down evenly with the back of the spade. It should then be lined out to the required size of the bricks, and be cut with a sharp spade or turfing iron. In a few days the bricks will be sufficiently dry to handle, when they should be set up edgeways to dry thoroughly, and if exposed to the sun for two or three days they will be ready to receive the spawn. In introducing the spawn, two holes should be cut in each brick at equal distances, the holes being of such a size as to admit a piece of spawn as large as a pigeon's egg. This should be well beaten in and the surface made even with a little manure. When the process of spawning is completed, the bricks should be collected together in a heap and covered with enough short manure to cause a gentle heat, being careful that there is no rank heat or steam to kill the spawn. This must be carefully attended to until such time as the spawn is found to have penetrated through the whole of the bricks, after which they should be staked away in any convenient dry place. The spawn in the first place is generally procured from nurserymen, but it can be gathered from meadows where there are cattle tracks: it may easily be discovered by breaking up some of the soil, having the appearance of a white mould and smelling exactly like Mushrooms. This will retain its vegetative powers for years, providing it be kept dry. It is advisable at times to procure a change of spawn, as this, like most other vegetables, gets worn out in time.

A well-known Mushroom grower gives a somewhat different receipt:—"Six barrow-loads of cow manure, two barrow-loads of horse-droppings, and one of loam, should be well mixed and beaten. This may be done on the floor of an open shed, and when firm the mass should be made into cakes 8 in. square; these should be placed on edge to dry in an airy shed, and should be frequently turned. Of course the bricks must be protected from rain. When half dry make a hole 2 in. square in the side of each brick, and place in it some good old spawn, inserting it so deep as to be a little below the surface. Cover up the hole with a little of the compost of which the bricks are made.

When the bricks are nearly dry place them on end in a dry shed, piling them one on the other with spaces between them. Cover them over with hot manure, keeping it on for three weeks or a month; the temperature should not, however, exceed 60° or 65° Fahr. If the manure show signs of heating the bricks too much, the covering must be reduced so as to reduce the temperature. The spawn will soon begin to run through the bricks, and when it appears at the surface in the form of a white mould; they should be removed, and allowed to finish drying in order to arrest its growth till it is required for use."

Nails.

When nails begin to rust it is almost impossible to stop them from becoming eaten away in a very short time; in this case prevention is better than cure. Mix 1 pint of Linseed oil with 2 oz. of black lead, stirring until the whole is thoroughly incorporated; heat the nails red-hot and steep them in the mixture. They should then be well drained and shaken up in an old nail-bag until dry. The Linseed oil and black lead cover them with a film of varnish which is impervious to wet. The above proportions will serve for an almost indefinite quantity.

Nature Printing.

There are three different methods of obtaining copies of flowers and leaves from the flowers and leaves themselves. One is by dabbing them with printing ink and obtaining an impression of them by pressure as if they were type or wood blocks; another is by obtaining photographic impressions upon prepared paper; a third, by laying the leaves or flowers on a copper plate and passing the whole between powerful rollers, thereby producing an *intaglio* from which impressions like those from a copper or steel plate can be taken. This process was well carried out some years ago.

Those who have access to a laundry roller press, or an ordinary copying press, can adopt the following method of direct printing:—The best paper to use is ordinary wove paper without water-marks, such, in fact, as is used for book printing; those who can afford to be luxurious may use thin drawing paper. First select the leaves, and then carefully press and dry them. If they be placed in a botanical press, care must be exercised not to put too great a pressure on the specimens at first, or they will be spoiled for printing. An old book is the best for drying the examples to be used; then get a small can of printer's or proof ink, and a small leather dabber, which can be bought for a few pence at any shop where wood engravers' materials are sold. Take a bit of ink about the size of a Pea, and work it on a small piece of slate or glass with the dabber until it is perfectly smooth. A drop (or two at most) of Linseed oil will assist the operation. Having worked the ink perfectly smooth, give the leaf a thin coating, being careful to spread it equally, not to dab it on in blotches, or the clear effect will be lost. Having applied the ink, take a sheet of paper of the size required, and lay the leaf ink downwards upon it, placing it between the leaves of an old book, which must then be subjected to a moderate pressure in a copying press, or passed between the rollers of the washing machine. If a press be not at hand, lay the book on the floor and stand upon it for a few seconds, an operation which answers the same purpose. Impressions can be taken with greater rapidity by this process than by any other, and a very little practice will enable any one possessing ordinary ingenuity to succeed in producing them. Soft book paper is the best for the purpose, and, previous to using it, place a few sheets between damp blotting-paper, which causes it to take the ink still more readily. At first you will find that you lay too much ink on the leaf, which then produces too dense an impression. After a little practice you will feel how much ink to lay on each description of leaf. If you find the impression too black, use the leaf once again without inking it. If the midrib of the leaf be too thick, so that the parts near it do not come into contact with the paper, it must be shaved down with a sharp knife. Composite leaves, as of the umbelliferæ, should be divided, and their parts printed separately; other details will soon be learnt by practice.

—— M. Bertot, of the Paris Academy, has just made known a simple method of taking impressions of plants requiring only a large sheet of paper, some Olive or other oil, black lead or powdered charcoal, and resin. The paper is first lightly oiled on one side, then folded in four, so that the oil may filter through the pores, and the plant may not come into direct contact with the liquid. The plant is placed between the leaves of the second folding, and in this position pressed (through other paper) all over with the hand, so as to make a small quantity of oil adhere to its surface. Then it is taken out and placed carefully on white paper; another sheet is placed above (since two impressions can be taken), and the plant is pressed as before. On now removing it an invisible image remains on the paper. Sprinkle over this a quantity of black-lead or charcoal, and distribute it in all directions, as in applying sand to writing; the image then appears in all its parts. With an assortment of colours the natural colours of plants may be reproduced. To obtain fixity, resin is previously added to the black lead in equal quantity; the impression is fixed when it is exposed to a heat sufficient to melt the resin. The method of reproducing leaves by photography will be found under that heading.

Onion Fly.

Many remedies for the Onion Fly (Anthomia ceparum) have been suggested and tried with various success. Curtis mentions the following, viz.:—Dressing the beds with nitrate of soda, covering them with a layer of ½ in. of charcoal, mixing it with the earth before the seed is sown; spreading or sprinkling with coal-dust, lime, soot, salt, or watering them with a strong decoction of Wormwood, soap-suds, &c. These do not seem to have done much good. Mr. Knowles has tried most of them without effect. Rolling where the soil is light has been recommended; such a soil seems to be more favourable to the development of the Fly than that of a stiff, clayey nature, through which it is more difficult for the mature insect to make its escape on emerging from the pupa; and that many must perish in soil of this description is obvious from the fact that numbers of pupæ have been found imbedded in the clay several inches underground, from which it would have undoubtedly been impossible for the Fly to get out under ordinary circumstances. Curtis speaks of pulling up the affected bulbs, whose state is first shown by the yellow drooping leaves, and destroying them at once, to prevent further damage, as one of the most effectual cures; for it is hopeless to think of saving the Onion when the grub has established itself in it. The course recommended by Mr. Andrew Murray is for the cultivator, at the time when the Fly appears in April or May, to keep a very sharp look-out and to destroy the first brood, which is his only chance. Let him pass his hands gently over the leaves, and if he find any eggs, let him remove them or crush them gently by hand. If he watch at the right time, it is only a week or ten days' daily examination. It is, perhaps, impossible so to watch on very large crops, although even then, where it has once been found that the eggs are being laid, we think it would be money well laid out to employ many female hands to go gently over the leaves and draw off or squeeze the eggs. M'Intosh recommends that before sowing the ground should be watered with the following mixture;—To 20 gallons of rain-water add 1 peck of unslaked lime, ½ peck of soot that has not been exposed to moisture, 2 gallons of urine, 1 lb. of soft soap, and 2 lb. of flowers of sulphur. When the mixture has settled sufficiently to pass through the rose of a watering-pot, it may be applied. It has also been recommended to sow Onions on ground previously occupied by Turnips as a preventive of this pest. Nitrate of soda is not only to kill the grub but to improve the crop. It should be used in the proportion of about 4 cwt. to the acre, and not more than two or three times a season. In using the nitrate of soda, it is necessary that the foliage of the Onions be dry, as to let it drop on the plants when they are wet causes a burnt or shrivelled place wherever it touches them. It is a good plan to water after sowing it, or to select a time when a shower may be expected when going to use it.

Make some strong lime-water, and add to it as much soot as will make it into a thin paint, and with this water the crop the moment the maggot appears. This soot mixture is so stimulating a manure, that it should always be used to increase the weight of the crop. House-slops mixed with lime and soot would be still more powerful, both to destroy the maggot and improve the plant; but unless rain followed immediately, it would be advisable to drench the ground with pure water the day after application. Ground intended for a crop of large Onions should be prepared in the autumn, and after being dug over should be watered with a mixture of sulphuric acid and water, made so strong as to burn the tongue. This will destroy every animal in the soil, and the winter rains will wash it away entirely before spring.

The Onion is much more subject to the maggot in light soils than in heavy land, especially in old worn-out gardens. Various remedies have been recommended for its destruction, or as a preventive to its spreading; but nothing appears to be of any use after it once attacks the crop. By a judicious preparation of the soil its attacks are rendered less frequent. In light land, the addition of liberal quantities of new soil, with a good dressing of salt (½ lb. to the square yard), applied as a surface-dressing during the autumn or winter, with an inch of soot pointed into the ground before sowing, renders the crop less liable to its ravages. It would appear from the result of careful experiment that the smell of soot is very distasteful to the Onion Fly, and generally prevents it from depositing its eggs; but, whenever any of these troublesome pests have come to life, the soot-dressing so frequently recommended will not be found a sufficient safeguard against its insidious attacks.

Orchid Beetle.

There are certain descriptions of Beetles which are most destructive to Orchids. If allowed to get to any considerable head amongst these plants the damage done in absolute value becomes a serious matter. They attack the flower-spikes whilst young and tender, and the young growths; still worse, so far as weakening the plants, is the destruction of the roots. When we consider the value of many of the rarest of these plants, the necessity of unremitting attention in the destruction of these pests will be apparent. The moment they are disturbed the astonishingly rapid powers of motion possessed by these Beetles is brought into play. Their movements, especially in the night when a light is brought to shine upon them are almost equal to those of a bird. They secrete themselves amongst the drainage of the pots, in the material in which the plants are growing, when it is dry whilst the plants are at rest, in cracks in the walls where the mortar has become displaced, near the pipes, or in any out-of-the-way place. They increase fast, and when once they gain access to a plant-house are very difficult to thoroughly eradicate. The thick, fleshy roots of Vandas, Aerides, and Saccolabiums in particular, become a prey to them. They never feed in the daytime, and are rarely seen during the daylight unless disturbed from their haunts; consequently they may exist in much larger numbers in any place than is supposed. By diligent searching with a lamp after dark some may be caught, but more will make their escape. Small pots containing treacle and water mixed in equal proportions placed about their haunts are sometimes used. By such means some may be caught; but with means of this description in plant-houses it is difficult to catch them in sufficient numbers to keep them down so low as desirable. To get rid of them entirely Mr. T. Baines recommends Roth & Ringeisen's Beetle Poison, obtainable through any druggist.

Orchid Insects.

Most plants are subject to insect-pests, although it is not often that they do any serious damage, that is, if ordinary precautions be taken by the cultivator or his assistants to prevent injury. Thrips is one of the worst, especially if the temperature of the house be excessive and the atmosphere dry; but in the houses devoted to cool Orchids this ought never to be the case. The cool, moist atmosphere of the Odontoglossum-house is not the most favourable for insect life. Red spider sometimes, though rarely, makes its appearance in a dry corner, and if there be a yellow thrip in the house it is almost certain to commence operations on the juicy foliage of Cypripedium Schlimmi. The yellow fly, so common in Orchid-houses, will infest the flower-spikes of Odontoglots and Calanthes, but two or three moderately strong doses of Tobacco smoke will clear them out. Tobacco rag, *i.e.*, the old coverings of the rollers used in the manufacture of twist, is far preferable to the vile rubbish sold as Tobacco paper, and the chances of burning are considerably reduced by its use. In fumigating Odontoglossums great care must be taken, or the smoke will do serious damage. They should never be subjected to fumigation if in the least degree shrivelled by a hot and dry atmosphere. Mr. Culley, who has charge of the well-known collection of Cool Orchids at Ferniehurst, never hesitates to smoke his Odontoglots, but it must be remembered that their bulbs and foliage are fresh and plump, in which condition it rarely harms them, though Mr. Bateman, whose name in connection with Orchids is well known, strongly objected to the use of Tobacco smoke in the Odontoglossum-houses. Remedies for thrips and red spider will be found under their respective headings.

Paints.

Paints are pigments ground with oil to a thick paste, ready to be thinned down afterwards with oil or turpentine to a consistence adapted for application with a brush. In mixing or thinning down paints, boiled oil is used for outdoor work, except for the decorative parts of houses, when a portion of turpentine and pale Linseed oil is often added; while for indoor work generally Linseed oil, turpentine, and a little driers are used. The smaller the proportion of oil the less will be the gloss, and the greater the ultimate hardness of the coating. For flatted white, &c. (the colour being ground in oil), it requires but a slight amount, for the object is to have it dead or dull. The best driers are ground litharge for dark colours, and ground sugar of lead for light ones. To preserve mixed paints in pots from skinning over, they should be kept constantly covered with water, or, better still, with Linseed oil. Brushes when out of use may be laid in clean water. When required for another colour, they may be cleaned with some oil of turpentine. The best preservative for old woodwork, and in fact all woodwork that is exposed much to the weather, is whiting, mixed in pure, raw Linseed oil; let it stand until it is perfectly mixed, then reduce with oil and add sufficient driers. This makes a hard, durable paint for the first coat; reduce it to an ordinary thickness for priming, and apply with an ordinary brush. It must be thoroughly worked up together, so as to remove all the lumps of the whiting. For hot-water pipes, ordinary Brunswick black may be used, or lamp-black and boiled Linseed oil. The lamp-black should be made red-hot, and when cooled should be beaten up very fine, adding oil until the mixture is sufficiently thin to be applied with a painter's brush. The pipes should be warm during the process.

For zinc work, to which it is difficult to make paint adhere, and which rapidly oxidizes when exposed to air and moisture, Dr. Böttger recommends a solution of 1 part of chloride of copper, 1 part of nitrate of copper, and 1 part of chloride of ammonium, 64 parts of water, and 1 part of commercial hydrochloric acid. This solution acts as a sort of mordant. It is put on with a wide brush over the zinc, which immediately becomes a deep black colour, which changes in the course of twelve or twenty-four hours to a grey, and upon this grey surface any oil-paint will dry and firmly adhere. Summer heat and winter rain will have no effect in disturbing this covering, which affords complete protection to the zinc.

For painting glass-houses, the best thing to use is white lead mixed with Linseed oil. The wood should be quite dry when put on, for internal damp soon works out and blisters and destroys the paint. The long, dry period in summer is the best time to apply it. In the case of new houses the woodwork should have a good coat of paint before it leaves the workshop, and other coats should be added as the weather will permit. To allow the wet to penetrate the wood before it is painted is a sure means of starting decay, which afterwards cannot be remedied. Few greenhouses or conservatories are improved in appearance by being painted in too many colours, two being generally sufficient; for instance, a pearl-white, light lemon, or stone colour for the wood, and a light blue or French grey for the iron. These delicate colours should only be used in conservatories and other places where the atmosphere is dry.

In stoves, forcing pits, and similar structures the woodwork should be painted a dark stone colour, so as not to show the dirt too easily; for the same reason the outsides of all houses should be of a darker hue than the insides. The outside of a house should be painted every three years, the inside every six years. Nothing is gained by letting the paint drop off before it is removed. Greenhouses and similar structures are now-a-days built of such slight materials that the only means of preserving them is to keep them constantly well painted. For darkening the glass of greenhouses a mixture of whiting, Brunswick green, and skimmed milk forms the best material, the thickness of course depending on the exposure of the glass; or whiting and skim milk alone may be used, composed as follows:—A piece of whiting the size of a Walnut reduced to a fine powder and thoroughly mixed with 2 or 3 quarts of milk. It is better to make a trial on a piece of glass first. Let it dry, and add to the milk or whiting as less or more shading is required. If it be put on quickly and thinly by one man with a brush and another follow with a dry duster-brush, merely daubing it quickly with the points of the dry brush, the shading will have the appearance of shaded ground glass, and look neat.

A cheap and lasting paint for rails, gates, and other outdoor work is made by mixing 2 quarts of skim milk, 8 oz. of fresh-slaked lime, 6 oz. of boiled Linseed oil, and 2 oz. of white Burgundy pitch, dissolved in the oil by a gentle heat. The lime must be slaked in cold water, and dried in the air until it falls into a fine powder, then mix it with one-fourth part of the milk, adding the mixed oil and pitch by degrees. Stir with a wooden spatula, adding the remainder of the milk. Lastly, add 3 lb. of the best whiting, the whole to be thoroughly mixed. Two coats are necessary, and this quantity is sufficient for 27 yards twice over. Antwerp green, Navy green, or Brunswick green might be used in lieu of the whiting, omitting, or using in a much smaller proportion, the slaked lime.

A practical authority on house painting states that paint applied to the exterior of buildings in autumn or winter will endure twice as long as when applied in early summer or in hot weather. In the former case it dries slowly, and becomes hard like a glazed surface, not easily affected afterward by the weather, or worn off by the beating of storms. But in very hot weather the oil in the paint soaks into the wood at once, as if it were a sponge, leaving the lead nearly dry and ready to crumble off. This last difficulty, however, might in a measure be guarded against, though at an increased expense, by first going over the surface with raw oil. Furthermore, by painting in cold weather we escape the annoyance of small flies which invariably collect during the warm season on fresh paint.

Fireproof Paint.—Take a quantity of the best quick-lime, and slake with water in a covered vessel; when the slaking is complete, water or skim milk, or a mixture of both, should be added to the lime, and mixed up to the consistency of cream; then add 20 lb. of alum, 15 lb. of potash, and 1 bushel of salt to every 100 gallons of creamy liquor. If the paint be required to be white, 6 lb. of plaster of Paris, or the same quantity of fine white clay, may be added to the above proportions of the other ingredients. All these ingredients being mingled, strain through a fine sieve, and grind in a colour mill. When roofs are to be covered, or when crumbling brick walls are to be coated, fine white sand is mixed with the paint, in the proportion of 1 lb. of sand to 10 gallons of paint; this addition being made with a view of giving the ingredients a binding or petrifying quality. This paint should always be applied in a hot state, and in very cold weather precautions are necessary to keep it from freezing. Three coats of this paint are deemed, in most cases, sufficient. Any colour may be obtained by adding the usual pigments to the composition.

Pear Tree Slugs.

The Pear tree frequently suffers severely from the attacks of a disgusting-looking and offensively-smelling viscid larva, black like a little leech, which seems glued and immovable on their leaves, and which eats the parenchyma from one of the sides, usually the upper side, beginning not at the edge, but in the middle, and leaving the anastomoses of the smallest nerves and the epidermis of the underside intact, so that the leaves which it has attacked resemble a piece of very fine lace. It has a form and appearance which induced Reaumur to give it the name of *ver-limace*, slug-grub or slug-worm. When, at the end of the autumn, it has acquired its full size, it has a slight resemblance, with its head drawn under the first ring and its tapering extremity, to a small tadpole. It is provided with twenty feet, but it is necessary to detach it from the leaf in order to see them. After having changed its skin four times the black, gluey, slimy surface disappears, and it becomes of a yellow orange colour; it descends the tree, and makes for itself a cocoon with grains of earth joined by some threads of silk, which, when once it has hardened and assumed its final state of leather-like toughness, is insoluble in water, and forms a perfect protection from wet. In this cocoon the slug resides during the remaining portion of the autumn and winter, and until the following summer; it is contracted in size, but otherwise unchanged in character. Its change to a chrysalis does not take place until spring has far advanced, and then that state is but of short duration; fourteen or twenty days suffice to mature the perfect insect, and at the expiration of this it emerges from the tomb, and the same cycle of existence is re-commenced and re-completed as before.

A series of experiments on the best way of destroying this pest was made a few years since in America, where it is a much more formidable plague than it is in England. As soon as the Slugs were observed at work in spring they were treated to a plentiful supply of dry sand, thrown up into the higher branches with a shovel, and over the lower ones through a sieve. The sand stuck thickly to the slimy skins of the grubs, completely covering them. Supposing the enemy conquered, no notice was taken of him for some days, when he was found to have recovered from the assault, and to be as vigorous as ever. It was then determined to test the sand experiment on a smaller scale. Several small branches of Pear trees were selected and marked, on each of which were six Slugs, and these were well powdered over, and completely covered with sand. On examining them it was found that they had shed their sand-covered skin, and had crawled out as slimy as before. The sand was applied a second and a third time, with similar results. Ashes were next tried in the same manner as the sand had been, and were found equally ineffectual. Ashes and sand being both useless, the Slugs were treated to a strong dose of hellebore and water, which soon finished them. On the 13th of August a branch of another Cherry tree was plucked, on which there were sixty-four Slugs. This branch had only nine leaves, so it may be supposed it was thickly inhabited. A dose of hellebore and water was showered on them of about the usual strength—1 oz. to the pailful—when they soon manifested symptoms of uneasiness, twisting and jerking about in a curious manner. Many died during the day, and only six sickly-looking specimens remained alive the following morning, and these soon after died. In the following year by the last week in August the second brood of Slugs was hatched, and those trees which had previously escaped were all more or less infested. A raised platform was rigged up in a one-horse cart; on this was placed a barrel of water in which 1 lb. of powdered hellebore had been mixed, and from this elevated stand the mixture was showered lightly on the trees from the rose of a watering pot. It was astonishing how quickly the trees were cleared by this method; scarcely a Slug could be found on a tree the morning after the application had been made, and 10 lb. of hellebore, with five or six days' work of a man and horse, served to go over the whole ground. Powdered hellebore has been successfully tried in England on a small scale, but there is an apparent difficulty in raising the water to a sufficient height to be of much service among the giant Pear trees of Worcestershire and Herefordshire. A practical Canadian Pear grower, who has had to contend with frequent swarms of these insects in his Pear orchards, states that he has found nothing so good or so easily applied as powdered hellebore, 1 lb. of the powder mixed with a barrel of water being strong enough. His mode of operating is as follows:—The barrel of hellebore and water is placed on a one-horse cart, and on the cart is erected a suitable platform for the operator, who is supplied with an ordinary watering-can. From his elevated position on the platform he showers the death-dealing liquid on the foliage, driving from tree to tree as the sprinkling is effected; a light shower is all that is needed, and effectually cleans the trees. Passing up one side of a row and down the other side where the trees are not very large, an active man can easily operate on from 200 to 300 in a day. Where the trees are too large to admit of their being entirely reached in the manner described, the liquid can be effectually applied with a garden syringe.

An English grower states that his Pear trees having been attacked two years ago, he found lime-dusting most effectual, using for the purpose an old-fashioned tin pepper-box. Ten days later they received a second dusting, and evidently a severe lesson had been administered to them, inasmuch as the next year only a very few made their appearance—so few, indeed, that they were easily destroyed by hand-picking. This summer he has kept a vigilant look-out, and has not been able to discover one on his trees, whilst the fruit crop is most abundant and promising. Mr. Hobday, of Ramsey Abbey, considers that the best way of getting rid of the Slugs is by deluging them with strong soot and lime-water, applied forcibly by means of the garden-engine at pretty frequent intervals.

Perfume Jars.

A fine and permanent perfume, pot pourri, for jars may be made by mixing ½ lb. of common salt with ¼ lb. of saltpetre, ¼ oz. of storax, half-a-dozen Cloves, a handful of dried Bay leaves, and another handful of dried Lavender flowers. This basis of the pot pourri will last for years, and you may add to it annually petals of Roses and of other fragrant flowers gathered on dry days, as fancy may dictate. By the same rule you may add, if approved of, powdered benzoin, chips of Sandal-wood, Cinnamon, Orris-root, and Musk. A very excellent pot pourri may be made in winter with 1 lb. of dried Rose petals bought at a chemist's, mixed with 4 oz. of salt and 2 oz. of saltpetre, on which put 8 drops of essence of ambergris, 6 drops of essence of Lemon, 4 drops of oil of Cloves, 4 drops of oil of Lavender, and 2 drops of essence of Bergamot.

Photographs of Leaves and Flowers.

The best method of taking impressions of leaves and flowers is undoubtedly by photography, but it is much more expensive than the ordinary processes, besides which it requires no small amount of patience and dexterity to procure a good result. The materials required are albumenized paper, nitrate of silver, distilled water, hyposulphite of soda, acetate of soda, chloride of gold, Kaolin or china clay, and white wax. One must also have a few pressure frames with spring backs, glass plates to fit them, two porcelain dishes, a 2-oz. measure, a box of scales and weights, a few sheets of filtering paper, some black pins, a glass funnel, a filtering stand, two stoppered bottles, and glass rods for stirring the solution. If residing near a photographic dealer, he may be induced to prepare the solutions at a slight increase on the cost of the materials, the necessary quantity of which and the size of the pressure frames depend entirely upon the scale previously fixed. Having provided materials, fill one of the dishes to within ½ in. of the top with distilled water, measure this off into a clean stoppered bottle with the 2-oz. measure, and having thus ascertained how much the dish will hold comfortably without slopping over, make up the quantity in the bottle to an even number of ounces. For every ounce of distilled water in the bottle add 60 grains of nitrate of silver and shake up until the whole is dissolved. Label this "Silver Solution." Next dissolve 15 grains of chloride of gold in 8 oz. of distilled water in a stoppered bottle, and label it "Gold Solution." Dissolve 30 grains of acetate of soda in 6 oz. of distilled water, and add to it ½ oz. of the gold solution. This should be kept in a stoppered bottle and labelled "Toning Solution." It is used for changing the colour of the finished print from a foxy brown to an agreeable purple or black tone. It should be mixed at least twenty-four hours before use. It can be used over and over again for months, merely adding ½ oz. of gold solution and 30 grains of acetate of soda in proportion for every two sheets of paper. Dissolve 4 oz. of hyposulphite of soda in a pint of ordinary water in a common corked bottle which is to be labelled "Fixing Solution." Not more than one sheet of paper should be fixed with this amount of solution. By "sheet" of course is meant the large sheet, measuring 23 in. by 17 in. All solutions containing gold or silver must be made with distilled water, and kept from the light in stoppered bottles. The fixing solution may be made of ordinary water and kept in a common corked bottle. The first part of the process is to sensitize a piece of the albumenized paper on both sides in order to take the negative print, which is to serve as a matrix for producing any number of positive copies. Pour the silver solution into one of the dishes, which must be kept for this special purpose only, and float the paper glossy side downwards on the top of the liquid for five minutes, taking care to avoid air-bubbles. Strip it gently off the surface of the solution as if it were a piece of skin, and lay it down again on the other side for another five minutes, so as to saturate it back and front. Lift up the corner with a black pin, slip it off the surface of the solution as before, allow it to drain for a couple of minutes, and pin it to a suspended string or tape to dry. The nitrate of silver solution must now be poured back into the proper bottle, and when required for use should be filtered through filtering paper into the dish. The funnel being placed on the stand, a piece of filtering paper is folded in four and opened out to form a cone. This is slipped into the funnel and the sensitizing solution poured into it so as to drop into the dish without splashing. The whole of this operation must be performed either by candle-light or in a room from which most of the white light is excluded by a sheet of yellow calico. When dry the sensitized paper should be put away in a light, tight, dry box or cupboard, or shut up in a book between two sheets of blotting-paper, so that the printing ink cannot act on the sensitized surface. The paper thus prepared will keep for two or three days, and is used for taking negative impressions of the leaves, that is to say, impressions in which the lights and shades are reversed. The leaf to be used should be perfectly dry, and the ribs, if too prominent, should be pared level with a sharp knife, otherwise part of the impression will be blurred. Place one of the pieces of glass in the pressure frame, and on it the leaf reverse side downwards. Lay the prepared paper on the leaf with the glossy side next to it; close the pressure-frame and expose the whole to the full effects of the sun. The amount of exposure depends on so many different circumstances that no absolute rule can be laid down with respect to it. Suffice it to say that the impression must be examined from time to time, and when the lightest parts of the paper are just beginning to colour, the picture may be considered as being fully exposed. Both in this and the positive process, nothing but experience will teach the exact amount of exposure. Some leaves on fine days require less than half-an-hour's exposure, while others in unfavourable weather must be exposed for one or two days. The negative picture must now be fixed, that is to say, it must be made insensible to light by immersing it in the fixing solution in an ordinary soup plate or pie dish for half-an-hour, after which it should be washed in water in a large baking dish or pan for twenty-four hours, the water being changed at least six times, the object being to wash every particle of the hyposulphite solution out of the picture. If running water be obtainable it should be used, in which case the picture will be thoroughly washed in from six to eight hours. It should next be hung up to dry, or dried before the fire. Warm a common slate until it is just too hot to touch, lay the negative down on it, and rub it all over with wax until it is thoroughly saturated. Iron it between blotting-paper to remove the superfluous wax, and the process is ended. The paper for taking the positive is prepared in the same way, with the exception of the glossy side only being sensitized. The impression from the negative is taken exactly in the same way as was that from the leaf, the exposure in this case being just as much a matter of judgment as in the other. When fully exposed immerse the print in a dish filled with the toning solution, taking care to move it backwards and forwards until the proper tone is obtained; this may be done in the faint light from a window with the shutters nearly closed. When the tone is satisfactory wash the print at the tap and treat it in the same way as the negative print, of course omitting the waxing process. The subsequent treatment of the picture must be left to the operator's own taste. The most rigid cleanliness must be observed, and the fixing solution being utterly antagonistic to the silver solution, great care must be taken to prevent any admixture. Merely handling the silver dish or funnel with fingers covered with the fixing solution would be quite enough to spoil the silver solution beyond recovery. Whenever even the bottle containing the fixing solution has been handled, the hands should be well washed and rinsed before performing any of the other operations.

Ponds.

Where there is no stone basin to a pond it should be puddled with clay and then covered with coarse gravel. The clay should be from 6 in. to 12 in. thick, well worked with water into a tenacious paste, and then beaten or trodden with the naked feet into a close mass. Instead of a regular slope it is best to form the sides in the manner of terraces, so that the flower-pots containing aquatic plants may be dropped into their places on a series of descending shelves, and removed again for the winter if the plants require protection. Where plants, such as Lilies, are to remain permanently, strong loam should be laid on the clay for them, and the whole covered with gravel before letting the water in. The best material for fountain basins and statuary is Ransome's patent imperishable stone.

Pot Maggots.

Flower pots—cutting-pots especially—are frequently infested with the maggots of the destructive beetle Biorhyncus saliatus. Hand-picking at the roots is the best remedy when they have established themselves in pots; but for cutting-pots the soil used should be examined, and, where necessary, roasted, which ought to keep the pots free from them. Plunging the pots in boiling water, where the plants are strong enough to bear it, will also eradicate the pest.

Potato Beetle.

Although the Colorado Beetle has not yet made its appearance in this country, it is said to be steadily working its way eastward, and we know not at what moment it may cross the ocean; it can do no harm, therefore, to give a remedy for this formidable pest. The best remedy that can be recommended is Paris Green, known better in this country as Scheele's Green, *i.e.*, arsenite of copper, mixed with ashes or flour, in the proportion of 1 part to 12 or 15 parts. It should be dusted over the plants in the morning when the dew is on the foliage, and should always be repeated after rains. Three pounds of Paris Green to about 40 lb. of flour, ashes, or air-slaked lime will be enough for 1 acre of Potatoes.

H. C. Tucker, of La Salle, informs us that he finds carbolic acid entirely efficacious in the destruction of the Potato Beetle, obviating the use of Paris green. A little over 1 tablespoonful of crude carbolic acid is added to 1 gallon of water, and the liquid is then sprinkled by means of the fine rose of a watering-pot over the infested plants. A much larger proportion of the acid destroys the plant. This remedy is cheap, and easy of application.

Preserving Plants and Flowers.

Dr. Asa Gray, the eminent American botanist, gives the following directions for preserving plants for the herbarium: —For collecting specimens, the only things needful are a small round trowel, a strong knife, and a botanical box or vasculum. These boxes are made of tin, and in shape resemble a sandwich case, the lid opening for nearly the whole length on one side. They are made in various sizes; the most convenient and generally useful, perhaps, is one about 15 in. long and 6 in. across. The specimens collected should be either in flower or in fruit. In the case of herbaceous plants, the same specimen will often exhibit both at the same time, and both should be secured whenever it is possible. Of small herbs, especially annuals, the whole plant, root and all, should be taken. Of larger ones, branches will suffice, with some of the leaves near the root. Enough of the root should be retained to show whether the plant is an annual or a perennial. Thick roots, bulbs, tubers, or branches should be thinned with a knife, or cut into slices lengthwise. For drying the specimens a good supply of soft and unsized paper —the more porous and bibulous the better—is wanted, together with some convenient means of applying pressure. All that is requisite to make good dried botanical specimens is to dry them as rapidly as possible between many layers or sheets of paper, to absorb their moisture, under as much pressure as can be given without crushing the more delicate parts. The best drying paper is that which is made specially for the purpose, and which may be obtained from Mr. E. Newman, 9, Devonshire Street, Bishopsgate, London, E., but the softer sorts of cheap thick wrapping paper will answer very well. The drying pads are made by stitching from eight to a dozen sheets lightly together round the edges.

When the specimens are brought home, each plant should be carefully laid out in a folded sheet of thin, smooth, unsized paper, the flowers and leaves being arranged in the position which they are to retain when dried. The folded sheet with its enclosed specimen is then to be placed between two of the drying pads, and these again between two smoothly-planed boards of suitable size. Placing the whole on a table or on the floor, a weight of half-hundredweight or more (ordinary bricks form very convenient weights) is put on the upper board, and the specimens are so left until about the same hour next day, when the pads are to be removed and fresh well-dried ones put in their places, the boards and weights being also replaced as before. The pads which have been used are to be hung up to dry, so that they may take their turn at the next shifting. This process must be repeated daily until the specimens are no longer moist to the touch, which for most plants requires about a week; after which they may be transferred to the sheets of paper in which they are to be preserved. If very thick pads be used, it is not necessary to change them every day after the first two or three days. It is also to be observed that several pairs of pads, each with its enclosed specimen, may be placed between the same pair of boards, but in that case the weight applied to the upper board must be proportionally increased. When the specimens are quite dry, they may be kept in folded sheets of neat and rather thick white paper; or they may be fastened on half-sheets of such paper, either by slips of gummed paper, or by glue applied to the specimens themselves. Each sheet should be appropriated to one species; two plants of different species should never be attached to the same sheet. The generic and specific name of the plant should be written in the lower right-hand corner, where the time of collection, the locality, the colour of the flowers, and any other information which the specimens themselves do not afford, should be also duly recorded. The sheets should be all of the same size; 16½ in. by 11½ in. is a convenient size. The sheets containing the species of each genus should be placed in genus covers (made of a full sheet of thick coloured paper), which fold to the same dimensions as the species sheet, and the name of the genus is to be written on one of the lower corners. These should be arranged under the Orders to which they belong, and kept in closed cases or cabinets, either laid flat in compartments or else in thick portfolios, placed like folio volumes, with the names of the Orders lettered on the back.

The Rev. George Henslow proceeds somewhat differently. The materials recommended by him for this purpose are common cartridge paper, thick white blotting paper, cotton wadding, and millboard, all cut to the same size. The plants should be gathered in dry weather, and soon after the flowers open when their colours are brightest. Succulent plants, such as Daffodils, Orchids, or Stonecrops, should be put into scalding water, with the exception of the flowers, for a minute or two, then laid on a cloth to dry. Arrange the specimens and papers in the following order:—Millboard, cartridge paper, wadding (split open, and the glazed side laid next to the cartridge paper), blotting paper, the specimens having small pieces of wadding placed within and around the places to draw off all the moisture as quickly as possible, blotting-paper, wadding as before, cartridge paper, millboard. When the specimens, &c., are thus arranged heavy weights should be put on them: about 30 lb. the first day, 60 lb. afterwards. Remove them from under pressure in a day or two; carefully take away all the papers, &c., except the blotting papers between which the specimens are placed; put these in a warm air to dry, whilst the removed papers, &c., are dried in the sun or by the fire. When dry (but not warm) place them in the same order as before; put all under the heavier pressure for a few days, when (if not succulent) they will be dry. Flowers of different colours require different treatment to preserve their colours. Blue flowers must be dried with heat, either under a case of hot sand before a fire, with a hot iron, or in a cool oven. Red flowers are injured by heat; they require to be washed with muriatic acid, diluted in spirits of wine, to fix the colour. One part of acid to three parts of spirit is about the proportion. The best brush with which to apply this mixture is the head of a Thistle when in seed, as the acid destroys a hair pencil, and injures wherever it touches, except glass or china; therefore it should be used with great care. Many yellow flowers turn green even after they have remained yellow some weeks; they must, therefore, be dried repeatedly before the fire, and again after they are mounted on paper, and kept in a dry place. Purple flowers require as much care, or they soon turn a light brown. White flowers will turn brown if handled or bruised before they are dried. Daisies, Pansies, and some other flowers must not be removed from under pressure for two or three days, or the petals will curl up. As all dried plants (Ferns excepted) are liable to be infested by minute insects, a small quantity of the poison, corrosive sublimate dissolved in spirits of wine, should be added to the paste, which it will also preserve from mould. The best cement for fixing the specimens on to the paper or cardboard is gum paste. It is composed of thick gum water and flour mixed in warm water by adding both together while warm, and of a consistency that will run off the hair-brush.

There are several ways of preserving flowers in their natural colours, such as drying, smoking with brimstone, &c. There are several different processes, each adapted to the condition of the flowers which are to be dried. The most simple of all is to cut them in a dry state and hang them in a dry, shady place on strings or on stakes, not too thick, where for many years they may dry and remain till they are used. In a room not closed against the daylight, or at least against the sunlight, the colour will not keep well, but will bleach more and more and become pale, while in a damp room the flowers will rot. If, however, they are to be used for bouquets or other decorations, it is a very good plan to place them in a slightly damp atmosphere the day before, where they may attract a little moisture; if used in quite a dry state, they are too liable to break, which is prevented if they have thus been moistened a little. Care, however, should be taken as to the state of the flowers when cut for drying. The best state for most kinds of flowers is when they have not yet begun to bloom (not yet opened), because after being cut and hung up they always, in some degree, continue their blooming; but if cut in a too full blooming state, they pass, while drying, into the state of ripening, *i.e.*, they ripen their seeds and are afterwards useless, as those flowers are too liable to fall out. If all this be attended to, the following kinds of flowers preserve their natural colours very well:—Statice (many varieties, especially S. incana, sinuata, and armeria) keep beautifully; Gypsophila elegans, very pretty in bouquets, even in those of fresh flowers, and much used for this purpose on the Continent; Gomphrena globosa purpurea, Helichrysum (many varieties, especially the hardy annual ones, but they ought to be cut in a very early stage, or in bud, because they are finest if cut before they open). To the Helichrysum belongs also the celebrated Immortelle plant, Acroclinium roseum, a pretty flower of a beautiful rosy colour; Rhodanthe Manglesi, a little smaller than an Acroclinium, and one of the prettiest of flowers for drying; Delphinium, all the blue or red varieties, as Ajacis, candelabrum, and the blue perennial varieties, especially fine also is our common Delphinium Consolida, which represents the finest blue among dried flowers, and may be found in the summer time in the fields in some places. There are also the Grasses which keep well, and are of a very ornamental character, either by themselves in Grass bouquets, or together with other dried flowers, giving them a lighter appearance, for instance, Gynerium argenteum, the pretty varieties of Agrostis (A. pulchella and nebulosa), Lagurus ovatus, Hordeum jubatum, Briza and its varieties, among which is our common Briza media, one of the finest of this genus, and many others. We now come to flowers which are more difficult to dry, and which would lose their colour and form if dried in the manner already described, such for instance, as Viola tricolor maxima, Pelargonium, Geranium, &c. They must all be dried in silver sand; the silver sand must be rendered quite clean, without any organic matter whatever, by repeated washing, until the sand ceases to discolour the water; afterwards it must be perfectly dried. To make it fit for the purpose, however, heat the sand rather high, and in this state mix with it by constant stirring a small piece of composite candle, which prevents the sand from adhering to the flowers. Afterwards have a box not higher than 3 in., but as broad as possible; this box should have instead of a bottom a narrow-meshed iron-wire net at a distance of ¾ in. from where the bottom should be. Place the box on a board and fill with sand till the net is just covered with a thin layer of sand; upon this layer of sand place a layer of flowers, on that a layer of sand, then flowers, and so on; the layer of sand should vary in thickness, according to the kind of flowers, from ⅛ in. to ¼ in. In this way the box will hold two or three layers of flowers, more than three will not answer well; this being done the box must be removed to a very sunny, dry place, the best being close under the glass in an empty greenhouse, &c., exposed to the full influence of the sun. If the weather be sunny and dry the flowers will be perfectly dried in our English climate in ten days or even a week of sunny weather; and if we have no sun at all, but the weather be foggy and wet, we must dry our flowers in a dry room which is slightly heated. When the flowers are dry the box is lifted a little, the sand falls gently through the iron net, and the flowers remain in their positions over the net without any disturbance whatever. They should then be taken out carefully and kept in a dry and, if possible, dark place, where no sun can reach them, and afterwards they will keep very well for many years. In this way nearly every kind of flower, single or double, may be thoroughly dried. Generally, they are dried in this way for the trade—Pansies, Pelargoniums, Geraniums (the double ones are especially fine), Asters, Roses, Calceolarias, Aconitum, &c.; care is, however, to be taken that the flowers are cut in dry weather, and that, while lying in the sand, no part of the flower shall touch another part, as this always spoils the colour and causes decay. Sand must be filled in between all the parts of a flower, therefore it is necessary to insert the double flowers in an erect position, in order to fill the sand between the petals, while most of the single-blooming flowers, especially Pansies, must be put in with the stalks upwards. With Calceolarias, Aconitum, and other flowers which are formed like them, the cavity of the flowers must be carefully filled with sand before laying them in. White flowers do not retain their pure white colour, but always become slightly tinged with yellow. Among dried flowers we have hardly any representative of a pure white, except the Ammobium alatum and white Immortelles.

If the brimstone process be adopted, we must proceed as follows:—The first thing necessary is to procure a chest suitable in size to the quantity of flowers intended to be dried, the best size for general use being one about 3 ft. or 4 ft. square. In the under part of one side of the chest there should be a small opening, to be closed by a bar, through which the basin containing brimstone must be put into the chest; this opening must be covered inside with perforated tin, in order to prevent those flowers which hang immediately over the basin from being spoiled. The chest should be air-tight, and in order to render it so paper the inside thoroughly. When the chest is ready for use nail small laths on two opposite sides of the interior, at a distance of about 6 in. apart, upon which lay thin round sticks upon which to arrange the flowers. Care should be taken, however, that the flowers on the sticks, as also the sticks themselves, are not too close together, or the vapour will not circulate freely through the vacant space around the flowers. The best way to hang the flowers is to tie two of them together by the ends of their stalks with a piece of mat or thread, and afterwards place them upon the sticks so as to prevent them from touching each other. When the chest is sufficiently full of flowers close it carefully, place a damp cloth on the sides of the lid, and some heavy stones upon the top of it, after which take some brimstone broken into small pieces, put it in a small flat basin, and with a match kindle and put it through the opening in the bottom of the chest and shut the bar. It is a good plan to make an air-hole on opposite sides of the chest, which will assist the ignition of the brimstone, and which should be closed when the latter burns freely. Leave the chest undisturbed for twenty-four hours, after which time it must be opened, and if the flowers be sufficiently smoked they will appear white, if not they must be smoked again, when a little more brimstone may become necessary. When sufficiently smoked, take the flowers out carefully and hang them in a dry airy place in the shade for the purpose of drying, and in a few days or even hours they will recover their natural colours, except being only a shade paler. To give them a very bright shining colour, plunge them into a mixture of ten parts of cold water and one of good nitric acid, drain off the liquid, and hang them up again in the same way as before. Thus preserved they will keep for years. The best flowers for this process are Asters, Roses, Fuchsias (single ones), Spiræas (red-flowered kinds, such as callosa, Douglasi, &c.), Ranunculus, Delphiniums, Cytisus, &c. The Roses ought to be quite open, but of course not too fully blown. A French writer, M. Boulade, states that if freshly-gathered plants be spread out between sheets of filtering paper in the usual herbarium manner, and then heated between two bricks in an oven for two or three hours at about 150° Fahrenheit, they will be perfectly and permanently preserved without impairment of the most delicate colours. The process is rendered more rapid and certain if the layer of filtering paper next the flowers be changed after about an hour.

There is a beauty about autumn leaves that is often overlooked, though it is well worth preserving. To have them in their best condition they should be dried as rapidly as possible after being gathered, or they will soon lose their brilliant colours. They may be placed between the leaves of some book that is of little value, or between folds of paper, that which is porous and unglazed being the best. The drying is sometimes hastened by passing a warm flat-iron over the paper. Change the paper every day until the leaves are quite dry, and then keep them between the leaves of a book, or in folds of paper, under a moderate weight, until wanted for use. They may be tastefully arranged upon white cardboard, in the form of wreaths, bouquets, &c., or they may be used to decorate lamp-shades, to surround pictures, &c. The leaves are first carefully oiled with boiled Linseed oil, upon the upper side only. A little oil is applied with a bit of cloth or a brush, and the surplus wiped off with a soft cloth. This increases the brilliancy of the colours, as well as their permanency. They are afterwards fixed in their places by means of strong mucilage.

Putty.

Glaziers' Putty is made by working ordinary whiting into a paste with drying oil. Common Putty becomes exceedingly hard with age, a circumstance which renders the removal of glass from sashes peculiarly difficult. Old Putty may be softened by using a paste of caustic potash, easily prepared by mixing carbonate of potash or soda with equal parts of freshly burnt quick-lime, which has previously been sprinkled with water, so as to cause it to fall into powder. This should be mixed with water to a paste, and spread on the Putty to be softened. Where one application is not sufficient, it should be repeated. To prevent the paste from drying too quickly, it is well to mix it with less water, adding some soft soap instead. By the application of a hot iron the Putty becomes so soft that the glass can be removed by the fingers and the Putty easily scraped away. All that is required is a block of iron about 2½ in. long by 1½ in. square, flat at the bottom, and drawn out for a handle, with a wooden end like a soldering-iron. When hot (not red-hot) place this iron against the Putty or flat on the glass, and pass it slowly round the sides of the square. The heat will so soften the Putty that it will come away from the wood without difficulty. Some of it may be so hard as to require a second application of the hot iron, but one experiment will give sufficient instruction to meet all difficulties.

Rabbits and Hares.

Rabbits and Hares are very destructive to young trees by gnawing away the tender bark above the crown of the roots. Most trees outgrow danger from Rabbits, which as a rule will only attack young trees; but Hollies and Laburnums are never safe, and the largest specimens are liable to destruction by these little pests. The following are amongst the most usual remedies:—

Assafœtida.—A teaspoonful of tincture of assafœtida in half a bucketful of liquid clay, mud, or muck of any kind, applied with a brush to the stem and branches of young trees will preserve them from the attacks of Hares and Rabbits without injury to the trees. Two or three applications during the winter will be sufficient.

Cork Guards.—Rabbits and Hares may be kept from gnawing young saplings by tying Cork guards round the foot of the trees. The material used is virgin Cork, at present so much employed in the construction of Ferneries, which can be procured in pieces of all shapes and sizes. It can be easily placed round the stems of young trees and attached in such a way that the attacks of Hares and Rabbits will be rendered ineffectual. The mischief caused to specimen trees planted near dwelling-houses, in parks, or on lawns, by cats and dogs, &c., may also be prevented by the same means. First fix the pieces in their proper position, and then fasten them together with wire or strong twine, an operation which can be done at a trifling expense. It would of course be better if such tree protectors could be made to close round the stems and open and shut by means of hinges.

Cow Manure.—A mixture of lime, water, and cow manure made pretty strong, forms an excellent anti-rabbit composition. There should be plenty of the latter ingredient, both to make it adhere properly, and because, if lime be in excess, the mixture dries too white upon the trees and is unsightly, whereas, if properly mixed it dries just the right shade of greenish-grey. Where tar is objectionable on account of its injuring the young trees, a simple mixture of soot and cow manure made thin enough to be put on with a brush, will help to ward off the attacks of Rabbits during ordinary seasons.

Faggots.—In large plantations where Hares and Rabbits have to be dealt with by the thousand, one of the best remedies is to get from 50 to 100 faggots, stack them up in any corner, and you will find the Rabbits burrowing under the stack in a very short time. Give them a month's peace, and then by the help of a net put all round the faggots, proceed to throw the wood over the net: you will find the Rabbits at the bottom of the heap, when you should be armed with a short, stout stick, and give them the *coup de grace.*

Sulphur.—A mixture of equal proportions of sulphur, soot, and lime made into a thick cream with liquid cow manure, is also very effectual in cases where a strongly-smelling remedy is not objected to.

Tar.—Where appearance is of no consequence Stockholm tar is recommended. Gas-tar should never be applied to young trees, especially if the bark be already stripped away from them. The stems should be tarred from the ground to about 20 in. in height. If the plants be wanted for ornament, the following plan is preferable if the extra expense be no objection:—

Instead of applying tar to the tree itself, stick three or four stakes round each plant at the distance of 9 in. or 1 ft. from it, then tie a piece of fresh tarred line round the stakes at the distance of 9 in. from the ground. The tar should be mixed with an equal portion of manure, of about the same consistence as the tar, or it may injure some of the trees. A strip of tarred paper tied round the stem is also of service where the Rabbits are not very numerous. Strong subjects may be daubed with a mixture of equal parts of gas-tar, cow manure, and water made into a thick paint. If there be any marks of old bites, they should be carefully painted over.

Various.—Amongst miscellaneous remedies we may cite the following:—Place a thin layer of Reeds or refuse hay round the stems, and fasten it with a tough Reed or tie of straw.—Rub the bark with something distasteful to them, such as strong-smelling grease.—The application of a paint made of butter-milk and soot when snow falls, and again in March, is said to be an excellent remedy.—Wire netting or tying Birch or Heath round the necks of plants, are effectual remedies in severe seasons where the Rabbits are numerous.

Rats and Mice.

The common small water-rat is considered a harmless animal that usually confines its operations to the margins of ditches or small running streams, but, like all the species, it is endowed with a considerable amount of cunning, and is sometimes guilty of committing depredations for which it is held blameless. Broccoli and winter Greens are his especial favourites; he gnaws the bark, and very often eats entirely through the stems, frequently puzzling the gardener as to the manner in which his vegetables have been destroyed. For his size, there is, perhaps, no animal so savage and voracious as the common Norway rat; and, if allowed to become numerous, the damage done both to garden and farm produce is immense. These vermin, often very destructive to ripe fruit, are especially good judges of Grapes, and, either from their acute sense of smell or from the possession of some wonderful instinct, they always attack the best-flavoured fruit first. If choice hothouse fruit be not obtainable, they will be content with Gooseberries, Nectarines, Plums, or even Morello Cherries, but in all cases they are sure to help themselves to the best of both fruit and vegetables. Many different plans have been suggested and described for their destruction both in the way of traps and poisons; but in dealing with poisons some experience in their manipulation is necessary in order to be successful. Where Rats are not numerous they may be got rid of by carefully stopping all holes in buildings with cement, trapping or snaring them in their runs, and afterwards filling up their holes in the banks or hedges with broken glass or some other obstructive material. Rat-holes can also be plugged with tow, hay, or some similar substance soaked in gas-tar, for though a Rat may break out of a tarred hole, he will never enter it again. The methods of extirpating rats, all more or less trustworthy, are simply endless. From a large number we select the following, which will be found the most efficacious:—

Arsenic.—Oatmeal or wheaten flour, 3 lb.; powdered indigo, ½ oz.; finely powdered white arsenic, 4 oz.; oil of Aniseed, ½ drachm. Mix, and add of melted beef suet or mutton tallow 2½ lb., and work the whole up into a paste. This receipt is used by the French Government.

—— Oatmeal or wheaten flour, 1 lb.; moist sugar, ¼ lb.; white arsenic and rotten cheese, of each 1 oz.; rat scent, a few drops.

Carbonate of Baryta.—Sugar and oatmeal, or wheaten flour, of each 6 oz.; carbonate of baryta, ¼ lb.; oil of Aniseed enough to make the mixture have a pretty strong odour.

Nux Vomica.—Oatmeal or flour, 1 lb.; nux vomica in very fine powder, 1 oz.; rat scent, 5 or 6 drops.

Tartar Emetic.—Tartar emetic, 1 part; oatmeal or flour, 4 parts; beef or mutton suet enough to make all into a paste; rat scent enough to give it strong odour.

Traps.—The use of traps as a remedy for Rats and Mice is greatly to be preferred to poison. Wherever children or domestic animals are about, the use of poisons should be strictly forbidden. Besides this Rats when poisoned frequently die behind the wainscoting, and the house becomes filled with a stench that is generally attributed to the sewers. In setting traps for Rats, it is as well to render the bait especially attractive to them by using one or other of the following rat scents:—Powdered assafœtida, 8 grains; oil of rhodium, 2 drachms; oil of Aniseed, 1 drachm; oil of Lavender, ½ drachm. Mix by shaking up well.—Oil of Aniseed, ½ oz.; tincture of assafœtida, ¼ oz.—Oil of Aniseed, ¼ oz.; aquafortis, 2 or 3 drops; Musk, 1 grain; work up the Musk and some of the oil with the end of a knife, and mix up the whole well before adding the aquafortis.—Traps should be always baited with some strong-smelling bait; cheese, for instance, should be well frizzled, and bacon and similar substances should be well fried before being used.

—— Fill a barrel half-full of water and sprinkle a layer of powdered Cork on its surface, and over this sift a layer of flour or oatmeal. Place a chair and a box or two in the neighbourhood, whereby the Rat will be enabled to gain the edge of the barrel. He sees nothing but the meal; he has no innate ideas which teach him to beware of the treacherous foundation on which that tempting surface rests. He sniffs, he leaps, and goes gently down through meal and Cork to his watery grave. If any of his friends see him disappear from the edge of the barrel they hasten after him to get their share of the probable plunder, and are in their turn taken in by hospitable death.

—— One of the best modes of catching Rats alive is by means of the common oblong trap with square ends, made solely of wire; one end to open upwards, when set by a fastener from the top communicating with the inside. This shuts with a spring when freed from the catch by the Rat touching the hook or a platform of wire inside to which the bait is tied. This trap may be used for catching several Rats at a time. In addition to a piece of bacon or cheese tied to the inner platform, place the trap on a wooden tray or board (about ½ in. wider than the trap all round), with slips of wood ½ in. high along three sides, leaving one end open for the door of the trap; on this place sufficient meal to bed the bottom of the trap so that the Rats can walk through it without feeling the wire, which scares them. This additional bait induces many to enter at one time, and frequently five or six are inside before the catch is accidentally freed by one of them, when all are caught.

—— Take a large plant pot, say 3 ft. in diameter at top and 3 ft. deep; sink it into the ground till even with the surface, and place about 1 ft. of water in it. Then take a deal board 3 ft. long, 6 in. wide, and ½ in. thick; saw off 1 ft. of it, which must be smoothly planed and re-fastened in its place with two easy-working brass hinges; then fasten a weak steel spring on to the longer part of the board to extend over the saw-cut on to the shorter part, so that by holding the board out horizontally, the spring will just hold this shorter part of the board on a level with the rest. The spring must, however, be only strong enough to do this and a very little more. This trap-fall is then placed half-way over the pot of water, and a large stone is placed on the other end to hold it firm. The drop is then well greased on the planed side, and some strong-scented bait is nailed on to the extreme end. The Rat will walk on to the drop, which will not yield till he is fairly on; one step more, and down he goes into the water, the drop returning into position for another customer. It is better to put something in the water, quick-lime for instance, which will kill the Rats speedily.

—— Cover a common barrel with stiff, stout paper, tying the edge round the barrel; place a board so that the Rats may have easy access to the top; sprinkle cheese-parings or other food for the Rats on the paper for several days, until they begin to believe they have a right to their daily rations from this source; then place in the bottom of the barrel a piece of stone, brick, or clinker, about 6 in. or 7 in. high, filling with water until only enough of it projects above the water for one Rat to lodge upon. Now replace the paper, first cutting a cross in the middle, and the first Rat that comes on to the top of the barrel goes through into the water, and climbs on the stone. The paper flies back to its place, and the second Rat follows the first. Then begins a fight for the possession of the dry place on the stone, the noise of which attracts the rest, who tempt the same fate—the result being that in the morning one Rat, the strongest of the number, is found alive, in solitary possession of the island, all the others being killed or drowned.

Various.—Amongst miscellaneous remedies the following may be tried:—Buy three or four ferrets and turn them loose on your premises in different places.

—— Find out the water they frequent; if a pond (which in many places is the sole surface water, the common supply coming from pumps), bar all approach but one, and set up traps in it.

—— Flag round the outsides of your stables and outhouses.

—— Let slates into all the angles of your walls; these angles are Rat ladders; with slates set in them Rats can get down but never can get up again.

—— Have all your ricks on Rat-proof rick stands.

—— Put sheet iron on the base of all your outside and granary doors, for most outhouses have one or two passages gnawed by Rats for their free exit and entrance.

—— In a wall garden a stoat might be encouraged, which would rid you of Mice, Rats, and many small birds.

—— If fruit trees be approached from below put weeds along the base of the wall, and pour on them gas-tar.

Mice, in their small way, are in some places nearly as destructive as Rats. The large bull-headed Grass Mouse eats its way, nibbling innumerable roads and runs in every direction through old pasture and meadow Grass. Its most destructive form of depredation is that of nibbling the bark off young plantation trees, coppice-wood, hedge-rows, &c., sometimes destroying many acres. Many fine healthy plantations and Holly hedges have been entirely destroyed by these mischievous vermin. The depredations of the field or garden Mouse are only too well known to farmers and gardeners, through their activity in digging up whole rows of Pea, Bean, Radish, and other seeds, by their stealing all the best Filberts, the Walnuts, Chestnuts, Beech-nuts, Acorns, common Laurel-berries, Portugal Laurel-berries, the hard kernels of Holly-berries, Thorn-berries, and a host of other berries and seeds, and hoarding the same for winter store. They will get into Cucumber frames, pits, or houses, dig up newly-sown seed of both Cucumbers and Melons, and what is still worse find their way in when the plants are in full vigour and bearing fruit, and make sad havoc; and to crown all, they will gnaw fine plants in full bearing right through near their roots, killing and destroying the whole at once, and they will act in the same way with various other kinds of plants, both indoors and out. They are special enemies of the Yellow Crocus; they will attack Crocuses the very first night after they are planted, and not only that, but they will continue to feast on them, old and young, as long as they are in the ground, whether in bloom or not; they only eat the bulbs and leave the Grass or foliage, but if the bull-headed Grass Mouse should make his appearance after the Crocuses have thrown up their young Grass above ground, he will graze on even that at that early season. They are also great enemies of young Carnations, which they devour greedily. As a rule Mice visit gardens and seed-houses in larger numbers than Rats; they are also more difficult to trap, being more cunning, besides their hunting grounds are distributed over a much larger area, their most mischievous work being confined to the open air. In the majority of cases, therefore, the only hope is in poison, the great question being which is the safest and least expensive mode of administering it.

Aloes.—This drug is of great use for keeping Mice from eating newly-sown Peas. Dissolve 2 oz. of the best Barbadoes Aloes in 1 gallon of water, and soak the Peas in it for twenty-four hours before sowing. The solution has no mischievous effect on the Peas. Gentian root may be substituted for the Aloes where the latter cannot be procured.

Ashes.—Covering the Peas over with a dressing of coal ashes is also recommended. After the Peas have been sown, and the surface levelled, cover up the rows with a layer of ashes about 2 in. thick. Mr. E. Hobday states that he never knew this plan to fail. He supposes that the ashes act by concealing the scent of the Peas.

Camphor.—Where valuable seeds are kept in drawers or boxes, they may be effectually preserved from the depredations of Mice by mixing a few pieces of camphor with the seeds. The camphor must be renewed occasionally, as it evaporates when exposed to the air.

Paraffin Oil.—If Peas be mixed with paraffin oil, in the proportion of a quart to a tablespoonful, and sown wet, no Mice will touch them. Petroleum and turpentine are equally effectual.

Plaster of Paris.—One of the cheapest and most easily obtained poisons for Mice is Plaster of Paris and Wheaten flour. Mix one part of plaster and three of flour, and be sure the mixing is complete. As damp soon destroys the efficacy of this mixture, choose dry weather to put the mixture down, and, having placed it in convenient spots, turn over it a large empty flower-pot, or a slate, to protect it from the weather. As it will rapidly absorb moisture, the mixture must be prepared again and again, in order that the Mice may have it fresh and dry. The carbonate of baryta mixture, recommended for Rats, has the merit of keeping best, but is much dearer.

Red Lead.—M. Gloede, in the "Revue Horticole," announces the following as a most effectual protection for newly-sown Peas:—"Twenty-four hours before sowing I steep my Peas in water. I then powder them over with red lead, rolling them about in it so that it may adhere to and cover the entire surface. After this I plant them in the ordinary way, and for ten years, during which I have followed this plan, my Peas have never been attacked by Mice."

Resin.—Peas, soaked in salad oil, and then rolled in resin, are thereby effectually preserved from the depredations of Mice and birds.

Traps.—A very successful trap for destroying Mice has been found to be the following:—Bury a rather deep earthenware basin in the earth till it is slightly above the surface, half fill it with water and plaster the rim inside with lard; the Mice in their efforts to reach the lard overbalance themselves, and after a short swim perish. Another simple and efficient trap is made in the following manner:—Take a tolerably tight barrel, bore a hole near the bottom as an entrance; throw into it an armful of ears of corn and a handful of rags or waste paper to make a nest, cover it so that the Mice may be kept in the dark, and let it stand quietly a few days to give them time to colonize, then plug up the entrance; dash in a few gallons of water, clean it out thoroughly, and set your trap again. Mice are also easily trapped with Peas first soaked and grown from ¼ in. to ½ in., and then threaded, two being allotted to each trap, left 1 in. apart on the thread so as to afford room for the Mice to put their mouths to it and bite asunder the thread; this is cut in lengths of 10 in., a knot being tied at each end and pulled into two slit sticks, which are run into the ground to hold up the Peas. Currant shoots or Raspberry canes cut into 1-ft. lengths may be used for this purpose placed conveniently for the Mouse to get at and nibble the thread asunder. On this rests one end of a brick, the other being on the ground, and when the thread is gnawed in two the brick falls on the Mouse and kills it. A slate should be laid on the ground for the brick to fall on, and the bait need not be higher than about 2½ in. from the ground. Hundreds of such traps may be set in the course of a day. They are the most simple, inexpensive, and surest mouse-catchers ever invented. —— The old figure of 4 trap, the spring trap, and a dozen besides, are too well known to need description.

Any of the Rat poisons mentioned above are equally killing in the case of Mice. One of the best baits for mouse-traps is made of equal parts of cheese, oatmeal, lard, or fat, and chopped tow. Mix these up together into a paste, so that it can be spread on the end of a stick without string. If held for a time before the fire, so much the better, as it sets fast when cold. This bait can be carried in the pocket when the trapper takes his rounds. One bait will last sometimes for twenty Mice.

All natural correctives, such as owls, hawks, ferrets, stoats, &c., should be rather encouraged. Those who nail up owls and other mice-eating "vermin" on barn doors should think of the plague of Mice, which is as surely coming to England as the gamekeeper is eradicating sparrows, hawks, ravens, jays, magpies, &c. Owls prey unceasingly on Mice by night and kestrels by day; these invaluable birds to both gardener and farmer should, therefore, be encouraged for this purpose, for without them crops in some places would be devoured by Mice. Cats are not of much use to clear a country; they do not catch the mice quick enough. The time to commence war on these destructive rodents is in March or April, when they begin to breed. There are several receipts for the destruction of Rats and Mice which owe their efficacy to strychnine; but we prefer to allow this article to be so far incomplete to advising our readers to use this fearful poison.

Red Spider.

If the size of this insect were proportionate to the damage it does to plant-life, it would be much more formidable in appearance than it is, but, being exceedingly small, it frequently escapes detection until the plants upon which it makes its onslaught have sustained serious injury. Great numbers of cultivated plants, especially those grown under glass, suffer from its ravages; but such as have thin, soft leaves, like Vines, Cucumbers, and Melons, are more subject to it than others. The living insects cannot exist in a low temperature, but their eggs are proof against the lowest temperature of our severest winters. The Red Spider has a great aversion to moisture in the atmosphere, and still more to its application directly overhead by the use of the syringe or garden engine, a fact which at once indicates the means most likely to prevent its appearance where water can be used plentifully without injury, in other respects, to the general health of the plants. In the stove the fruit-bearing Banana and the acrid-juiced Croton or Euphorbia also furnish food for it. Dipladenias, Hibiscus, Ixoras, Francisceas, Amarantus, Palms, Ferns, Dracænas, together with quantities of other plants, are affected by it. Through the growing season a plentiful and continuous application of water overhead with the syringe is necessary, and it frequently happens that this is insufficient to keep it down unless used in quantities that will make the soil too wet, and consequently injurious to the roots of the plants. In the stove do not sulphur the pipes, as there generally are numbers of plants that suffer from that practice; neither is the application of sulphur dusted over the plants safe in all cases, as it frequently causes quantities of the leaves to fall off. Orchids are not so often attacked by this insect as other plants, the humid atmosphere kept up in the houses devoted to them keeping it in check; yet the introduction of an infected plant will sometimes cause a good deal of trouble amongst the thin-leaved species, such as Dendrobiums, Lycastes, Sobralias, Odontoglossums, and some Oncids, and if a considerable number of plants be affected before it is discovered, every leaf must be regularly sponged with clean water until it is eradicated. Conservatory climbers, particularly such as Mandevillea suaveolens, Kennedyas, &c., are very subject to Red Spider, and it spreads from such plants apace over everything under them on which it can live. Persistent use of the syringe or garden engine is all that can be done in such a case. Some greenhouse plants are very subject to Red Spider, as, for instance, Fuchsias, Statices, Pleromas, Pimeleas, Chorozemas, as well as numerous soft-wooded plants, but a liberal use of the syringe will destroy it. There is one greenhouse plant which Red Spider seems to like better than almost all others, viz., the Glory Pea (Clianthus puniceus). Wherever this, or anything that is similarly subject to this insect, is grown, they should be examined during the growing season every few weeks, for if neglected, and the insect permitted to thoroughly establish itself, it not only completely spoils the plants upon which it first makes it appearance, but spreads to any others standing near them. Pimeleas should be regularly syringed during the growing season every evening, getting well to the under sides of the leaves, for if these plants ever get thoroughly infested with this insect, they never afterwards get into a free habit of growth. Even Heaths, if placed in contact with plants suffering from this pest, will be seriously damaged by it, if not discovered before it has got much hold of them. For any plant of slow growth, which retains its leaves naturally for years, it will at once be obvious that the destruction of its foliage is far more serious than in the case of deciduous plants, or such as are of quick growth, and consequently are enabled to recover from any injury of the kind. If the leaves of plants grown for the beauty of their foliage, such, for instance, as Cordylines and Dracænas, be injured by the ravages of insects, they can never be replaced, as, when once they get yellow, which they quickly do through the effects of this insect, they fall off prematurely. Red Spider does more harm to Vines than all other insects put together. Where it has established itself during the season, as soon as the leaves are off, the Vines should be pruned, taken down, and the oldest outside bark removed, without stripping it too closely, getting well into any hiding-places where the eggs are deposited; then paint the whole of the canes thoroughly, from the collar to the extreme point, with a dressing of water, clay, and a little soot mixed to the consistency of thick paint, to which add 1 lb. of flowers of sulphur to each gallon. Scrub all the wood and ironwork thoroughly with soap and water and limewash all the brickwork. If there be an inside border, remove 2 in. of the surface-soil, and add an equal amount of new material. When the house is again started, and until the Vines come into bloom, use plenty of moisture in the atmosphere, and syringe regularly overhead. Those who aim at high-class Grape-growing, generally cease syringing after the opening of the first bloom; but the amateur had better begin syringing again as soon as the berries are set, and continue to do so daily until the fruit begins to colour; it will make the bloom thinner, and so far will injure the appearance of the fruit, but the chances are that the Vines will finish the crop better without distressing them half so much as if the syringe had not been used after the flowering stage, for the Spider is almost certain to make its appearance before the fruit is nearly ripe if the syringe be not used. In the case of Vines the most effectual means for its destruction is the application of sulphur to the pipes or flues, but if the house be flued, care must be taken that the sulphur is not laid on the flue too near the furnace, or the consequences may be most disastrous on account of the ignition of the sulphur. With hot-water pipes this cannot occur. To one part fresh lime add two parts flowers of sulphur, and mix with as much water as will bring it to the consistency of thick paint. On a mild, dull evening, if possible, get the water in the pipes as near boiling as can be, close the house and impregnate the atmosphere with water, then regularly paint the pipes over with the mixture. If the weather be dull, so as to require little or no air during the following day, so much the better. An almost general impression prevails that if sulphur be applied to the pipes before the berries are stoned, the skin will be injured. In the case of tender-skinned sorts such will be the case, but Hamburghs, Muscats, Alicantes, or Lady Downes will not suffer. Where it can be managed one of the best remedies for Spider is to keep the atmosphere during the earlier stages of growth moist and continually charged with ammonia, either by means of a thin layer of stable litter (occasionally renewed) on the floor of the house, or by sprinkling the floor and walk with manure-water, or, better still, painting the pipes with guano in the same way in which sulphur is used. A moist atmosphere is one of the best preventives, for so long as the atmosphere of the house is moderately moist and the plants can be syringed once or twice a day it makes very little headway, but immediately these conditions are changed it spreads with extreme rapidity. Syringing the plants thoroughly is one of the best remedies, and when Grape Vines become infested the house should be shut up rather early in the afternoon and the Vines be well syringed. This can only be done before the Grapes begin to colour.

Sulphur.—The fumes of sulphur are most destructive to Red Spider, and the hot-water pipes in Vineries, Cucumber-houses, or Melon-pits, to which Red Spider finds its way, should be sprinkled with sulphur occasionally, or be painted with a mixture of sulphur and clay. For the first two or three days after the application of sulphur the pipes must not be made so hot that the hand cannot be laid on them with comfort, or the fumes will probably be so strong that the tender leaves will be injured. Sulphur, combined with daily syringing, is said to succeed well when soap mixture cannot be applied. Sulphur, however, is a very dangerous remedy, often doing as much harm to the plants as to their enemy, especially in the case of Grapes. Red Spider in Orchid-houses must be guarded against by means of a liberal use of the syringe and abundance of fresh air. If, however, the insects have obtained a foothold, eradicate them at once by repeated fumigations with Tobacco-cloth or rag. It is better to fumigate gently on two or three successive evenings than run the risk of burning the foliage by filling the house too full of hot smoke. If the plants be gently sponged over occasionally with tepid water, it will do much towards keeping them free from dust and insects.

Room Plants.

Room plants are so frequently affected by insect-pests of all descriptions, especially in the confined atmosphere of towns, that they require to be placed under a separate heading. The family of aphides supplies by far the greatest number of the pests which infest plants grown in rooms, and on account of their minuteness and remarkably rapid propagation they are very difficult to extirpate. The means both of preventing their devastations and also of extirpating them where they have established themselves, consist in good culture, cleanliness, fumigation, sprinkling or washing with various liquids, and dusting with good insecticide powders. By good culture, which includes ventilation at the proper time, and keeping the plants in a position not too warm nor too far from the light, the plants are enabled to form strong, healthy leaves, which are less liable to be attacked by such insects than if they were less favourably circumstanced. By attending to cleanliness all the decaying leaves will be removed on which the eggs and young of the insects often lie. When young shoots and leaves are much infested with them the best remedy is to cut them off altogether and burn them, as when so attacked they, even when thoroughly cleansed from insects, are usually distorted or perish soon after. Plants from which they are to be removed should be shifted from among the other plants into a place where no others are near them. The stem-shoots and both sides of the leaves should be carefully brushed and then washed with warm water and a sponge to remove the "honeydew" with which the stems and leaves of such plants become covered. If the infested plant be small, take three or four Laurel leaves, beat them all over with a hammer, so as to thoroughly bruise them; then place them round or under the plant and cover with a small bell-glass. Let all remain closed for a few hours, and the aphides will be found dead, each hanging by its proboscis only. If this process be repeated within a day or two to make sure, the plant will be perfectly freed, and in some cases it is not again attacked. This way of killing aphides may be acceptable to those who dislike Tobacco smoke; all danger arising from an overdose of it to a very tender plant is avoided; and the Laurel is so generally grown, it must be almost everywhere at hand for the purpose. The pot and the surface of the soil should, in all cases, be cleaned and thoroughly freed from all insects which may have fallen on them. This is the surest way of getting rid of the mealy bug and the shield scale, which do not appear to be much affected by fumigation. Moreover, when the green fly (aphis) has been killed by fumigation, the plants should be afterwards sponged over. Fumigation with Tobacco is the only means that can be employed. In rooms that are usually occupied Tobacco should not be used, as its offensive smell will remain for weeks afterwards. The plants should therefore be fumigated in a small room set apart for this purpose, or under a bell-glass of suitable dimensions in a large room. When fumigation is employed against the mealy bug, thrips, &c., the smoke should be made very dense, and should also be repeated after a few days in order to kill any insects which may have been hatched since the first fumigation, care being taken not to fumigate more than is necessary. Light fumigation with Tobacco may be used with most plants without injury to them, provided they are not placed too near the vessel containing the heated coals. Strong fumigations should not be employed with plants which have tender leaves or leaves covered with hairs, such as

Heliotropes, Gesnerads, Melastomads, as the total loss of the leaves is often the consequence of such treatment. The best thing to use in sprinkling is a solution of the genuine Persian Insecticide mixed with water. About 3 oz. of this Insecticide should be put into a 6-oz. glass bottle; the bottle should then be filled with methylated spirit, and left corked for about eight days in a warm place. About one part of this should be added to 200 of water warmed to 123° Fahr., and sprinkled through a fine syringe on the leaves and stems affected. The evening should be selected for the operation, and the sprinkled plants should be placed for the night under a glass, or in a cellar, or covered with oil-cloth, to prevent the rapid evaporation of the mixture. The fumes of the evaporating poison will destroy any insects which may have escaped the sprinkling. This is an excellent remedy against aphis, thrips, and red spider. When it is used against the mealy bug or the scale insect, one part of the mixture to fifty parts of water should be employed, and the sprinkling must be very thorough. A solution of black soap and guano may also be used, but it is not so effectual. Brushing and sponging is a still better plan than sprinkling, as the crevices and under sides of the leaves are more effectually cleaned in this way, after which a sprinkling of strong liquid insecticide, or a mixture of Tobacco-water, potash, and black soap will be useful; the plants so sprinkled should be washed with clean water next day. The last remedy mentioned is dusting with insecticide powders. When these are used, the plants should have been previously sprinkled with water, which will retain the powder better and prevent its being scattered. The principal kinds used are the Persian Insecticide, Tobacco-powder, lime, wood and peat ashes, gypsum, and for the mealy bug and the scale powdered sulphur. When cleaning the plants, all tyings of bast-mat, &c., and the sticks to which the plants are fastened, should be removed, as well as all loose chinky bark from the stems, as these are generally full of eggs. The remedies for the other insects feeding on room plants will be found under their respective headings.

Rose Pests.

There are at least half-a-dozen caterpillars that prey upon the Rose. The Rose Maggot is about one of the most mischievous of them all, and is very annoying to the Rose grower, boring into the best buds, and destroying many a cherished hope of first prizes. There seems to be no possibility of escape from it; every year it makes its appearance, and, if not destroyed in the spring as it comes to life, scarcely a perfect flower will be obtained, especially early in the season. At the time of pruning, every bit of the prunings, with the pips, if any remain, should be carefully gathered up and burnt. As soon as the shoots begin to push, and the leaves expand, the larvæ will make their appearance; they may easily be detected by the web they spin, coiling themselves up in the young leaves. It is here they must be looked for with care and destroyed, going over the trees once a week, crushing them with the fingers, for if allowed to remain, as soon as the buds make their appearance they will spoil them. In the usually confined beds of the amateur and over-sheltered Rose gardens of private establishments, this insect is much more prevalent and destructive than in the extensive open grounds of the grower for sale. The more exposed situations of the latter appear to be uncongenial to this and other insects that infest the Rose. The other caterpillars which infest the Rose are only to be got rid of by the above means. A species of White Scale (Chermes rosæ) sometimes occurs in such quantities on the shoots of young Roses that they appear to be covered with a white crust; they do not, however, adhere very tenaciously to the bark, and are easily removed by brushing the shoots with a stiff brush. The best time to do this is before the buds appear.

Rose Saw-flies.

There are five different Saw-flies which infest the Rose, viz.:—The Yellow Rose Saw-fly (Tenthredo rosæ), the White-banded Saw-fly (T. cincta), the Common Rose Saw-fly (T. rosarum), the Double-horned Rose Saw-fly (T. difformis), and the Yellow-banded Rose Saw-fly (T. zona). The only means of getting rid of these pests is by careful hand-picking, and by cutting off all shoots and buds as low down as possible directly they show the slightest sign of being attacked by the insect.

Rust on Grapes.

Rusty Grapes are the result of contact with some other object, such as the hand or head, or sudden cold draughts of air against the berries just as they are set, and above all of very hot pipes at that time, which will produce Rust on any variety of Grapes sooner than anything else, more especially if sulphur have been thrown on them. Of many well-proved cases of this it is sufficient to give one which happened in a well-known Vinery. Some years ago the man in charge inadvertently let the pipes get too hot in a Muscat and Hamburgh house when the berries had just set; the pipes were so hot as to smell strongly and blister the hand when held upon them. They were not so long, however, for in anticipation of the consequences the pipes were emptied as soon as possible, but not soon enough to save the Grapes; the Rust was visible a day or two after, being worst round the ends of the houses and along the front—in fact, everywhere near the pipes, and gradually getting less and less further up the roof. The Hamburghs were the worst affected, but some of the Muscats were bad enough. Lady Downes and Black Alicante seem less susceptible than most other varieties, but they take it occasionally. The best thing, therefore, is to avoid all these causes, and rather do with low temperatures in cold weather than allow the pipes to become too hot.

Scalds and Burns.

The principle upon which scalds and burns are now treated is that of excluding them as much as possible from the action of the air. The remedies for ordinary scalds and burns are of so simple a nature that any one can apply them in the absence of a medical man. Where the injury is severe, Olive oil mixed into a thick cream with finely-powdered slaked lime, whiting, or flour should be laid thickly over the place affected. Where the injury is slight prick the blisters in two places, absorb as much of the water with a soft cloth, and wash with tepid water. The burn should then be well floured from an ordinary dredger and wrapped up in soft cloths. Great care should be taken not to break the blister, but only to prick it, otherwise the air will get to the tender part, and possibly give rise to a painful sore. The flour should not be removed until the wound is nearly healed, except gathering sets in, when it should be washed off with warm water and Linseed or bread poultices applied in its place. If the pain be very great, relief may be obtained by plunging the part affected into cold water without removing the bandages.

Sealing Fruit Bottles.

The following plan for sealing bottles of preserved fruit is highly spoken of:—Cut circular pieces of thick, stout cloth sufficiently large to tie over the jar or can. On these pour enough bottle cement to cover a space that will fit the opening and extend over the rim. While filling the jars lay the cemented covers on the bottom of the stove oven to soften. When the jar is ready, wipe the rim dry and apply the cover, cement side downwards, smoothing out the wrinkles and tying it with a strong string. Afterwards cover the top with some of the cement thinly spread. A few minutes will show, by the depression of the cover, that the contents are secure. This is one of the cheapest, easiest, and most expeditious ways of sealing fruit bottles. The cement is made with 1 oz. resin, 1 oz. gum shellac, 1 cubic in. of bees'-wax. Melt these in a tin cup and mix thoroughly. Use a gentle heat to melt or remelt, as great heat may granulate the shellac.

Shanking in Vines.

This is one of the most puzzling diseases with which the gardener has to deal. The disease is incidental to bad culture and certain soils, and attacks the foot-stalks of the berries at or after the stoning period when the berries are changing colour. They lose their fleshiness, have a disagreeably acid taste, and soon shrivel and drop off if the bunch be shaken. In aggravated cases the whole crop is sometimes lost for several years in succession. Various causes have been assigned for the disease: such as great disparity between the temperature of the border and that of the Vinery, heavy cropping, excessively high temperatures, &c. No doubt debility, arising from any cause, will help to bring on the disease, but it is a fact that it will attack in its worst form Vines that possess the greatest apparent health and vigour, as regards wood and foliage, and where the highest skill is brought to bear on their culture. The only preventive, therefore, is to keep the Vines in as healthy a state as possible. The disease seems to be constitutional, and a remedy that will cure one Vine will leave another untouched. Whatever induces healthy vigour will tend to prevent shanking.

Skeletonizing Leaves and Flowers.

There are two ways of preparing these beautiful objects, one by allowing them to rot spontaneously in water, the other by boiling them in a solution of permanganate of potash or a mixture of lime and soda. Winter is a bad time for making Skeleton Leaves. The leaves should be gathered when at their prime—that is, when the earliest leaves begin to fall from the trees—and all that are broken or damaged in any way should be rejected, for, unless you put in leaves with perfect skeletons, you can never take them out. Appearances are often deceiving, and many an apparently perfect leaf (covered, of course, when put into the bath with its skin and pulpy coat) becomes an imperfect skeleton, the fibres decomposing as well as their envelope of pulp; but the least imperfection can never be improved or removed. Consequently let no time and patience be uselessly expended on any but the most perfect leaves. Partly decayed leaves are, therefore, out of the question; young ones equally so; what you require primarily and fundamentally is the perfect and mature leaf. Brown spots or specks of any kind upon a leaf render it useless for the purpose of skeletonizing. Those which bear the operation best are evergreens; the reason will, from the previous instructions, be at once apparent; and it will be equally apparent that the soft leaves of very quick-growing plants of annuals, &c., are incapable of the process; hence, we generally see the Holly, Ivy, and Magnolia; and to these we may add, as very suitable for the purpose, and affording variety and elegance of outline, and that fibrous network we term the skeleton, and which, by-the-by, is as peculiar to each individual kind of leaf as its form, the Orange, and Lemon, the Pear, Rose, Willow, Sycamore (very beautiful), Oak, Poplar, Hawthorn, Fig, &c., also the Butchers' Broom, the petals of the Hydrangea, the fruit of the Thornapple, and of the winter Cherry. Leaves containing much tannin, such as those of the Oak, Chestnut, Elm, Willow, Sycamore, Walnut, Hazel, &c., should be separated from the others, as not only do they take a long time to decompose, but the tannin impregnates the water, and prevents the decomposition of any which may be under maceration at the same time. Having obtained your stock of leaves, seed-vessels, &c., take an open earthen pan that will hold a gallon or more, put the leaves into it, and pour over them sufficient rain-water to cover them. Let the pan remain exposed to sun and weather without changing the water (gently and carefully stirring it now and then) until the outer coating or green part of the leaves is pulpy and sticks to the finger. This will depend on the water, the weather, and the kind of leaf; some leaves, such as the Magnolia and India-rubber, require several months, others a few weeks only. They are then to be taken out and washed by shaking them about gently in water, and placed in a shallow earthenware pan, keeping them steady by pressing the finger on the stalk, while the decayed portion is removed by a small, rather stiff, short-haired brush, when the woody fibre or skeleton will be displayed. When perfectly cleared from cuticle, &c., bleach the leaves in a solution of chloride of lime made by adding two tablespoonfuls to one gallon of water. The operation of bleaching may be expedited by adding a tablespoonful of vinegar to the solution. When the leaves are taken out of the bleaching liquid put them into clean water for a short time, and then carefully dry them, either between blotting paper before the fire or in the sun, after which they may be pressed flat in books. The best leaves for skeletonising are those of the Plane, Pear, Lime, Poplar, Sycamore, Tulip tree, different kinds of Ivy, Holly, Box, St. John's Wort, scarlet Passion-flower, Pepul tree, Wistaria, Eryngium maritimum, Carduus benedictus, Magnolia (various sorts), Alstrœmeria, Thistles, Barberry, and several of the Nettles. Seed-vessels—Stramonium, Campanula, Carthamus tinctorius, Tea tree, Mallow, Honesty, Hyoscyamus, Lavatera, Malope, Canterbury Bell, Poppy-heads, and the Winter Cherry, which is very beautiful. Professor Church, of the Agricultural College, Cirencester, gives in the "Chemical News" the following method for making skeleton leaves:—"The leaves are boiled for two minutes, then transferred to a strong solution of permanganate of potash, and gently heated. In an hour or two the laxer tissues may be easily removed by means of a brush. Sulphurous acid, or a solution of chloride of lime, may be used for bleaching them. The stains of permanganate of potash upon the fingers are easily washed off by dilute sulphuric acid."

Snails and Slugs.

All who have ever had a garden, or grown a Cabbage or a Cauliflower, have had to contend with Snails and Slugs. Dryness favours the movements of most vegetable destroyers, but the opposite holds good in the case of Snails and Slugs, whose greatest depredations are committed during damp weather and in early spring. The damage sustained by seedling Cabbage, Cauliflower, and Lettuce plants through their ravages is incalculable; and it is not the seed-bed alone that suffers, for, even after the plants are established in their permanent quarters, they are often eaten over near the surface of the ground and destroyed, a bed of well-grown, crisp Lettuce, Cabbage, or a row of winter Celery being a favourite feeding ground with them. They are equally at home in the plant-stove or Cucumber-house, with a winter temperature of 70°, or under a hand-light of Lettuce or Cauliflower plants, silently doing their work of destruction, unless prevented by hard frost. There are few Orchid growers who have not had cause to lament their presence, in the shape of young growths, flower-spikes, and roots eaten off, for here their operations are not interrupted by excessive droughts or pinching frosts. The wonderful powers of instinct possessed by even such pests as these are scarcely known to those even who make their habits a life study. In the open air, where Slugs and Snails are more numerous, and where their food abounds in greater quantity than in plant and fruit-houses, we have not an opportunity of fully seeing how they are attracted to a given spot where food suited to their taste exists. Slugs do serious harm in the Orchid-house by eating indiscriminately whatever young roots are made above the surface of the soil, as well as young growth and flower-spikes. They do not often exist here in great numbers; but a few continually get in, often in the shape of eggs, in the potting materials, or they find their way in under the doors. In the Cucumber and Melon-house, and in pits and frames devoted to the cultivation of these plants, Slugs are generally troublesome, being introduced by means of the fresh soil, which is frequently required in such houses. They are very troublesome, too, in Fern-houses, destroying the young fronds of some Ferns as they appear, such as, Adiantums, Thamnopteris, some Polypodiums, &c. They have such facilities here for hiding and breeding that it is difficult to eradicate them if once they are allowed to get to a head; continual trapping with materials such as above advised, and frequent hunting for them by candle-light will, if persevered in, clear the house of them. The means required for the destruction of these, like many other garden pests, are almost as varied as the different plants and situations to which their depredations are extended. Preventives, however, are the best remedies.

Apples.—As soon as the unmistakable slimy track of the Slug is perceived in the stove, Fernery, or Orchid-house, a few slices of sweet Apple should be scattered about somewhat plentifully. Look over them two or three hours after dark, when the Slugs are almost certain to be caught feeding.

Bran and Chaff.—Barley chaff and awns matted round Lilies and other tender or succulent plants or thick-foliagad hardy bulbs, is a good preventive. Bran is an article of which Slugs are extremely fond, and seems to attract them from all quarters. Mr. Coleman, gardener to Lord Somers, adopts the following method of using it:—A lad is sent along all the walks of the garden each evening with a bag or bucket full of bran, and he places a handful of it on the borders at every 8 ft. or 10 ft. or so, in a heap; early the next morning he traverses the same ground with an empty bucket, dust-pan, and small broom, the heaps being generally found covered with them; the lad then sweeps the whole into his dust-pan, and empties it into the bucket, and by the time he has finished his walk many hundreds, if not thousands, are thus captured. A week or two of such work, or even a day or two now and then, must be the means of saving a great deal of our garden produce. When collecting the Slugs a little salt and water should be thrown into the bucket, which will effectually prevent the escape of a single one when captured, as the salt causes them to sicken and die at once.

Cabbage Leaves.—When the ground is covered lime cannot always be used, especially in flower gardens; in these cases get some Cabbage leaves, warm them in an oven till hog's lard will spread over the surface; place them overnight near your favourite plants, and almost every Slug will be found under them in the morning. It is hardly necessary to say that there must be no salt in the lard. In the case of open borders, rockwork, and rootwork, Cabbage leaves should be placed every day round the plants to attract the enemy; a lodgment will soon be made on them. They can be looked over in the morning and disposed of, thereby saving the blossoms of our favourites from injury.

Earthen-ware Protectors.—These may be had in the form of an 8-in. flower-pot without the bottom. One of these put over each plant when planted out cuts off all interference from Snails until the plant has grown out of their reach. This plan is somewhat expensive at first, but cheap in the end, as the pots not only shut out Snails, but, if the days be hot or the nights very cold, they form an excellent protection to the plants when newly planted.

Hand-picking.—When everything else fails, hand-picking at night with a lantern may be resorted to. To be effective it must be persevered in night after night until the pest is diminished. It may also be resorted to early in the morning before they have got under cover. In the case of Cabbage plants pieces of flat tile well greased on the bottom surface should be placed here and there at distances of 6 ft. or 9 ft. apart, and looking them over twice a week through April and May. An active boy will go over a considerable breadth in a couple of hours, dropping the Slugs into an empty flower-pot, or any vessel in which they can be taken and destroyed. This slow and unsatisfactory business should, however, be dispensed with as soon as their numbers can be reduced by the more general means already advised, and, above all, by adopting a thorough system of cultivation.

Lime.—Quicklime dusted on the ground early in the morning is a good remedy for Slugs, but to be effectual it ought to be repeated within an hour, because the Slugs have the power of casting their skins, and after getting rid of the lime will seek shelter.—Dusting the crops with soot and lime is more or less effective whilst the weather is dry, but when showery it is washed off as fast as applied, and the dustings may be repeated until the remedy has as injurious an effect as the evil it is intended to check. Where such is the case the whole surface of the ground should receive a dressing of lime. There is no better time for applying this than at the early dawn —on one of those mild damp mornings we often get in April—at which time they may often be seen so thickly on the ground as scarcely to admit of a foot being put down without treading upon them. Four or five cwt. of lime will be sufficient for an acre of ground. It should be prepared by spreading it out thinly on a damp floor until it has absorbed as much moisture as to reduce it to a powder. The way to apply it is to procure a box as large as can be carried under the arm, and then sow it by hand in the same manner as sowing corn broadcast. In this way a man will in a short time go over an acre of ground; to be effectual the whole garden should be thus sown over. It must be observed that it is only on those damp, mild mornings that the Slugs will be out in number. If the air be at all dry or frosty, instinct teaches them to keep under cover, but if a favourable day be selected, and the work carefully done, more of these pests will be killed by one dressing in this way than would be destroyed by a whole season's labour with partial measures, nor is the lime wasted, for it acts beneficially on the land. In the case of kitchen garden crops, a sprinkling of newly-slaked lime over the parts most frequented by them forms one of the greatest obstacles that can be put in their way; but even this is ineffectual as regards annihilation. Lime should not be applied when rain is falling, as in that case its effects are then quickly lost. This remedy can be applied in the cool of the evening, when the Snails are busy at their work of destruction, and when the ground is moderately moist on the surface, or in the morning before the sun shines strongly.

Peewits.—A clergyman in Lincolnshire writes to a journal to the effect that his greatest friends in the garden and elsewhere, especially during the spring months, are a pair of Peewits. These birds, he states, hunt out the Snails and Slugs from amongst the Strawberries and young seedlings of all kinds, and effectually prevent any injury being done to plants or fruit. For two years he was without Peewits, and the Slugs increased to such an extent that he could scarcely pick sound Strawberrries, but since procuring more birds he has had no more Slug grievances. He finds the Peewits superior to both young ducks and sea-gulls as foragers for grubs, the birds being ornamental as well as useful.

Potato.—Slices of Potato scattered about stoves and Orchid-houses make excellent traps for Snails and Slugs. They should be examined nightly by candle-light three or four hours after dark.

Resin and Sweet Oil.—To prevent Snails from passing over walls and fences, place 1½ lb. of resin and 1 lb. by weight of sweet oil in a pipkin, and simmer over a fire until the resin is quite melted. A train of this placed along the top of the wall would be an impassable barrier to the Snails. The great advantage of this composition is that it never dries.

Salt.—A sprinkling of common salt on the top and at the bottom of a wall will effectually prevent Snails from climbing up or down it. A sprinkling of salt early in the Snail season will probably last for the year. A gardener stated that some years ago he could not rear a Tiger Lily flower. The Snails first ate the leaves, then the buds, and often the stalk. Having seen the effect of Salt on Snails, he made a slight cordon of it round the Lily stem. No Slug or Snail faced it after this.

Sand.—A 6-in. band of oil paint sprinkled while wet with coarse sand, or, better still, with broken glass, will stand the weather well, and prevent the Slugs and Snails from trespassing.

Seakale Pots.—The best traps for the large garden Snail are empty Seakale pots, with the lids on, placed on the ground at intervals of a few yards on each side of the wall, a little before the leaves begin to fall. If these be examined once a fortnight during the autumn, the Snails will be found attached to the inside of the pots, and before Christmas not many will escape. At the same time, every crevice in the wall on both sides should be carefully looked over, for a number of the small fry will be in existence, and must also be immediately destroyed.

Sea-gulls.—Where Peewits cannot be obtained, Sea-gulls form valuable exterminators of Slugs and Snails.

Tar.—Coal-tar spread on the top of a wall, or round the roots of a tree or shrub, is an excellent preventive; the difficulty with it is, however, that it wants constant renewing. A mixture of any cheap oil or paint, with coal-tar in equal proportions, keeps liquid for a much longer period.

Train Oil.—To prevent Snails and Slugs from climbing trees form a paste with train oil and soot, and lay it on in a circle round the tree, a few inches above the ground, and it will form a barrier over which Snails or worms will not pass.

Various.—Amongst miscellaneous remedies may be mentioned slices of fat meat, scraps of crisp fresh Lettuce. Ashes, sand, barley-chaff, short bristles, cuttings from the brushmaker's shop, chopped straw, and brewers' grains are good materials for strewing as baits.

Water.—A zinc trough, containing water, placed on the top of a wall, will effectually prevent Snails from climbing over. In Alpine gardens Snails are frequently so destructive that it has been considered desirable to construct a small rock-fringed streamlet round portions of the rock-garden containing the subjects most likely to suffer from them. This is not generally to be recommended, because of the difficulty of doing it well; nor is it generally necessary, inasmuch as the things commonly grown can be protected by ordinary means. It would, however, be practicable to run a neighbouring streamlet round a large rock-garden, concealing it here and there in shrubberies, &c., and letting it now and then meander through the Grass. A correspondent of " Science Gossip " states, that being much annoyed by Slugs he at length determined to fortify his Alpine bed, and admit none but such as could leap the ditch. This fortification he effected to his entire satisfaction by procuring a coil of zinc, which he cut into strips about 20 in. wide, and bent into U form, and buried as an edging round the bed, keeping it constantly nearly filled with water by connecting it with a fishpond. He found that neither Slug nor Snail ever crossed it, and it was very easy to banish all that happened to be enclosed. In small pots standing in the water he planted several pretty plants, such as Drosera, Pinguicula, Mosses, &c., taking care that no bridges were formed; the effect was very pleasing. At several potteries they are now manufacturing pots and pans with double sides to hold water between them for the same purpose, and to keep up a constant supply of moisture.

Zinc Collars.—Strips of perforated zinc, 6 in. in width, are used by many gardeners to keep Snails and Slugs from plants. A correspondent states that he encloses small Lily beds with strips about 6 ft. long, joined with wire as required; Cabbage leaves must also be laid round in order to trap any stray Slugs within the enclosure. A fine Hepatica angulosa in a border unprotected from Slugs, had every flower devoured before it had fully bloomed; but, since the zinc collar has been used, it has been untouched.

Stings.

The pain caused by the sting of a plant or insect is the result of a certain amount of acrid poison being injected into the blood. The first thing to be done is to press the tube of a small key firmly on the wound, moving the key from side to side to facilitate the expulsion of the sting and its accompanying poison. The sting, if left in the wound, should be carefully extracted, otherwise it will greatly increase the local irritation. The poison of stings being acid, common sense points to the alkalies as the proper means of cure. Among the most easily-procured remedies may be mentioned—soft soap, liquor of ammonia (spirits of hartshorn), smelling salts, washing soda, quicklime made into a paste with water, lime-water, the juice of an Onion, Tobacco-juice, chewed Tobacco, bruised Dock Leaves, Tomato juice, wood ashes, Tobacco ash, and carbonate of soda. If the sting be severe, rest and coolness should be added to the other remedies, more especially in the case of nervous subjects. Nothing is so apt to make the poison active as heat, and nothing favours its activity less than cold. Let the body be kept cool and at rest, and the activity of the poison will be reduced to a minimum. Any active exertion whereby the circulation is quickened will increase both pain and swelling. If the swelling be severe the part may be rubbed with sweet oil, or a drop or two of laudanum. Stings in the eye, ear, mouth, or throat sometimes lead to serious consequences; in such cases medical advice should always be sought as soon after the accident as possible.

Surface Caterpillars.

For small Surface Caterpillars the following mixture may be used:—¼ lb. of soft soap dissolved in a quart of boiling water, and filled up with cold to the amount of 4 gallons. Apply the mixture immediately, well wetting the roots of each plant. The grubs will rush to the mouth of their holes, and must be collected and destroyed at once, otherwise they recover, and go down deeper than ever. By two applications of the mixture, which does not hurt the most tender plant, all the grubs may be got rid of.

Thermometers.

Minimum Thermometers are filled with alcohol coloured with a vegetable material, and if exposed to great light or sunshine, that portion which is in the Thermometer stem will sometimes become bleached, and, in the process, deposit a substance which, if it surround the index, will prevent its moving freely in the tube. To adjust a Thermometer which is in the state here represented, proceed as follows:—Hold the Thermometer in the hand, bulb uppermost, and swing it violently backwards and forwards until the fluid in the ball (which possibly is not bleached) fills the stem entirely, then reverse the action, and swing the bulb downwards. This will have the effect of mixing the two portions of fluid, so that the bleached portion will be again coloured, and if not thoroughly so, repeat the operation. Lastly, stand or hang up the Thermometer for an hour, so that any particles of the alcohol hanging about the tube may be drained into the main column. The index will now flow freely in the tube if the experiment have been carefully performed, and no air bubbles left in the tube. These directions apply only to the horizontal spirit Thermometers; when once out of adjustment, the upright maximum and minimum Thermometers, which are partly filled with alcohol and partly with oil, are too complicated to be set right, except by a skilled workman. All such Thermometers should be strictly kept in the shade, as none but mercurial Thermometers will resist the sun's heat without risk of being put out of adjustment.

Thrips.

These may be classed with the worst insects with which we have to contend, especially in the indoor department. They do not increase so fast as the aphides, yet in some cases, as when they attack Vines, they are more difficult to destroy. The black kinds are most destructive to Azaleas, Vines, and Ferns under glass, and to such plants as Dahlias, Phloxes, and Verbenas out-of-doors. In some localities they attack late Peas in such numbers as almost to destroy the crops. The means required for their destruction vary with the different plants, and, unless means be taken to destroy them as soon as they make their appearance, they do irreparable mischief by destroying the vitality of the leaves, causing them to fall off prematurely, and correspondingly weakening the root power. Grape Vines, Melons, and Cucumbers are also frequently infested, and the insects usually find their way to plants suffering from an insufficiency of moisture at the roots, or that have been kept in a close, dry atmosphere. The best preventives are a proper supply of water to the roots, abundant ventilation, and a moderate degree of atmospheric humidity. Fumigating plants infested with Tobacco or Tobacco-paper in much the same manner as advised for the aphides is an exceedingly good remedy. For destroying Thrips upon Azaleas Mr. John Fraser, of the Lea Bridge Nurseries, states that in his establishment the following mixture has been found the best remedy:—Take 5 lb. or 6 lb. of soft-soap and dissolve it in about 12 gallons of rain-water, then add a gallon of strong Tobacco liquid; dip the plants, and before they become dry wash them in a tub of clean, soft water, and not one Thrips will be left alive. The same process should be gone through again in about a fortnight's time, so that the young (which appear to come from eggs attached to the backs of the leaves) may be killed as soon as hatched. A strong fumigation with Tobacco is a good check, but nothing answers so well as dipping the plants in the above mixture. It is not necessary to adhere strictly to the quantities of soft soap, &c., stated, as a much stronger mixture does not hurt the plants. Immersing the plants entirely so that every part is wetted is best, but if they be too large to dip, the syringe with a fine rose can be used. The above remedy is equally efficacious for other plants.

The best method for small plants is dipping them in moderately strong Tobacco-water, to a gallon of which has been added 2 oz. of Gishurst. For large plants that cannot be dipped, it is necessary to lay them down on their sides and syringe them all over, turning the plants during the operation, so as to wet thoroughly every leaf on both its upper and under surface. Not a single leaf should be missed, or the chances are that the dressing will not be effectual. Allow the mixture to dry on, and it will destroy the vitality of the eggs effectually. In the operation of washing it is necessary to use a trough, over which to lay the plants whilst being syringed, otherwise serious waste will occur. Every garden where plants are grown ought to be provided with a trough of this description; it should be made of strong galvanized iron, 6 ft. square and 10 in. deep, strengthened in the rim and across the bottom with stout iron wire. After syringing, allow the plants to lie on their sides until the liquid is quite dry upon them, as it is not desirable that it should run down in any considerable quantity amongst the roots. Plants that have been much affected with the insect should be washed in this manner twice, at an interval of a fortnight, in the autumn; and if it be thoroughly done very few will be attacked with the insects the following summer, unless some affected plant be introduced amongst them. During the growing season the plants should be frequently examined, and as soon as any of the Thrips are discovered they should be at once washed with the mixture, not allowing them time to spread.

Thrips may be readily destroyed by Tobacco smoke, but I do not approve of fumigating Azaleas, as I never saw an application of the smoke sufficiently strong to kill the insects without materially injuring the leaves, causing them to fall off prematurely; consequently it is much safer to destroy them by the application of Tobacco water. In the stove, Ixoras, Dipladenias, Franciscеas, Crotons, with numbers of other plants, are subject to their attacks. I find the best remedy is to wash the affected plants with Fowler's Insecticide (about 4 oz. to the gallon), dipping and syringing the plants in a similar way to that described for the Azaleas. Where these insects get amongst Vines they do serious mischief. After the crop is cut the living insects can be killed by repeated smokings; not so their eggs, which are deposited thickly on the young wood ready to come to life where there is sufficient heat to hatch them. The usual winter dressing of sulphur, clay, and soft soap, thoroughly applied, is sufficient to destroy them; but if they attack the Vines early in the season, or before the crop is cut, fumigation will not answer, for the Grapes will taste of the smoke to an extent that will spoil them. Sulphur mixed with clay and a little fresh lime, applied to the pipes in the same way as for red spider, will kill the mature insects, and the application must be repeated three times at intervals of eighteen or twenty days, so as to kill the young brood as they are hatched, before they have had time to breed. In all cases it is very important to watch for their first appearance and immediately adopt one of the remedies given above. The insects are small, rather long and thin, and blackish or yellow in colour, and until the colonies become large they are not readily seen. The insects keep for the most part on the under side of the leaves, and on the young shoots. The female lays her eggs usually along the margin of the midrib. The eggs are microscopically small, longish, round, and whitish. The larva is hatched in eight or ten days; it changes its skin four times; at the third change the rudiments of wings begin to appear; it takes about three weeks to reach its full development. Fumigation with Tobacco is the most approved remedy. It kills the perfect insect and the larvæ, but has no effect upon the eggs. The Thrips has a strong feeling for self-preservation, and no sooner does it scent anything wrong in the house than it drops from the plant and buries itself in the soil; hence the advantage of a second smoking in the same week, to catch them when they have returned to the plants. The process, consequently, requires frequent repetition—say once a fortnight, until the breed is exterminated. It is unnecessary to tell the gardener that this remedy must be used with caution, and not applied indiscriminately to all plants. Orchids suffer much from it, as do the Gesneraceæ and most Ferns. Cinerarias and Heliotropes do not like it. In such cases, sulphur in powder applied with the fingers to the moist leaves, and, still better, Gishurst Compound, have been found effectual. The small yellow Thrips is a more difficult insect to deal with than the black kind. The plants they attack are somewhat different, and not so numerous. Fumigation is frequently almost useless, from its habit of establishing itself down in the bottom of the young leaves as they unfold. Here there appears to be sufficient stagnant air to supply their breathing until the fumes escape from the house without injuring them in the least. The only way of attacking them is by the continued use of a very small bit of sponge tied on the point of a stick, so that it can be got down into the young unfolding leaves; or a small camel's-hair brush just damped with clean water, they may be kept under, but it is a slow process, and, unless there are but few plants, it is scarcely possible by this means to completely eradicate them. Continued applications of clean, tepid water syringed overhead every alternate day during the growing season of the plants will soon completely exterminate these pests.

Tipulæ Grubs.

The Grub of the Tipula oleracea (Crane Fly, or Daddy Long-legs, as it is familiarly termed) is exceedingly destructive to all the Cabbage tribe. The larva is easily known by its long cylindrical body being destitute of feet. The best way of capturing it in Cabbage beds is by setting traps of slices of Turnips or Potatoes fixed to a wooden skewer and sunk a few inches below the surface of the ground. The larvæ will be attracted by them, and if they be pulled up every other day thousands of them may be found attached to the baits, and can be readily scraped off and burnt, while the same baits may be reset. The Grubs of the Tipula are also excessively destructive to lawns and Grass plots. One of the best remedies is that adopted by the late Mr. Cutbill, who recommended rolling the Grass at night with a 2-ton roller with a thorn scrubber well loaded. For small lawns and Grass plots numerous remedies have been recommended. One of these consisted in watering the turf with a mixture of corrosive sublimate dissolved in muriatic acid in the proportion of 1 oz. to ½ pint of acid, and the addition of 60 gallons of water. Gas-water, quick-lime, lime-water, salt and water, and other cheap preparations that usually prove fatal to insects, are of no special value in this case, because to employ them sufficiently strong to penetrate the leathery jackets of these Grubs makes the case worse by killing whatever Grass still remains for the renewal of the turf. The best mode we have as yet heard of for dealing with this plague is contained in a report to the Parks and Open Spaces Committee of the Metropolitan Board by Mr. N. Sinclair. He says, "The experience by which I obtained this method was gained through a similar invasion of the Embankment Gardens by these insects four years ago, when I had the opportunity of studying their habits and ascertaining the best means for their destruction. I found that only certain portions of the gardens were infested, from which I infer that their haunts depend much on the wind and weather, being thus driven to collect in the most sheltered places where they deposit their eggs. The Grubs make their appearance in January, and when commencing their depredations may be captured in thousands by cutting square trenches 6 in. wide and 6 in. deep, into which the Grubs in their wanderings fall, and since they cannot crawl up the perpendicular sides of the trench, they may be swept up the next morning and thrown into salt, that being the only substance I have found efficacious in killing them. I have tried other things for that purpose, such as quick-lime, soot, snuff, &c., but none answered the purpose so well. The remainder of the Grubs that are not swept up turn to the chrysalis state, and in due time come forth as the well-known Daddy Long-legs, and soon after spread themselves abroad and deposit their eggs wherever it is most likely their offspring will find suitable sustenance. As soon as they make their appearance on the wing there is nothing better than heavy garden rollers. On a smaller scale garden rollers are also very efficacious. A correspondent of the "Field" gives the following remedy as being perfectly successful:—About six o'clock in the evening thoroughly roll the Grass and turf edgings infested with them, in every direction, so that none escape with a slight squeeze. The Grub which lies in the ground from the Tipula does an immense amount of mischief to the lawn. Roll the lawn with the wind, as the insect seems to be blown about at the mercy of the elements. In mild cases gas-water has been used successfully. Fowls are also very fond of the perfect insect, and a number turned out on the infested turf will do good service.

Tree Caterpillars.

The Goat Moth Caterpillar, which does much damage to large trees, especially Birches, may be destroyed by boring after them, and filling up their holes with paraffin oil and lime. The trunk should be well dusted with lime, and the trees well watched throughout the summer for any stragglers that may have escaped.

—— Coal-tar has been recommended as a remedy for that terrible insect, the Wood-gnawing Caterpillar (Cossus). It gets under the bark and into the wood of Elms, Willows, and Poplars, and destroys them rapidly. In some valleys where Poplar trees are cultivated to a great extent, it is a positive scourge. There is, however, a simple way of preventing the mischief; it consists in daubing the bases of the young trees every two years with coal-tar. A ring of this liquid painted on each tree will have the desired effect, as the Caterpillars dread it like the plague.

Tree Stumps.

To remove stumps from a field, all that is necessary is to have one or more sheet-iron chimneys, some 4 ft. or 5 ft. high; set fire to the stump and place the chimney over it, so as to give the requisite draught at the bottom. It will draw like a stove, and the stump will soon be consumed. With several such chimneys, of different sizes, the removal of stumps may be accomplished at merely nominal labour and expense. In the autumn bore a hole 1 in. to 2 in. in diameter, according to the girth of the stump, vertically in the centre of the latter, and about 18 in. deep. Put into it from 1 oz. to 2 oz. of saltpetre; fill the hole with water, and plug up close. In the ensuing spring take out the plug, and pour in about 1 gill to 2 gills of kerosene oil and ignite it; the stump will smoulder away, without blazing to the very extremity of the roots, leaving nothing but ashes. The stump must be in a fresh sappy state when the saltpetre is put in, or it will not permeate the fibres thoroughly, which is essential to the success of the experiment. Sprinkle on the tops of the stumps a pint or two of paraffin oil or petroleum, and as the stumps are seamed, weather-cracked, or decayed, it soon disappears. On the top of the stumps pile refuse wood, and after two or three days set fire to them, and they will be completely consumed. A lad can do the work, and have scores on fire at once.

Turnip Caterpillar.

This is the most destructive of all British insects, the Turnip fly not excepted. The egg is laid in June, either on the ground or on some plant, generally a seedling, close to the ground. Hatched in this situation the infant Caterpillar is enabled to attack the young Turnips, Carrots, Cabbage plants, Charlock, Mangold Wurzel, Radish, and also a number of the common weeds. When young its depredations are mostly about the surface of the ground, and it seems to delight in that particular part of a plant which lies between the root and stem; great numbers of young Turnips and Carrots are divided at this spot, the upper part being left to perish on the surface of the ground. It also visits our flower gardens. Very often in a bed of China Asters the leaves of a plant here and there will be found withering and curling up. The only remedy is looking for the mischief maker with candle and lantern, and picking up every Caterpillar. As it is destructive to the plants to dig between them, some gardeners, after becoming really acquainted with the enemy, sprinkle lime on the ground, others sawdust, others soot, others salt, others ammoniacal water from the gas-works; but the result of each method is uncertain and unsatisfactory.

Turnip Fly.

The Turnip Fly (Haltica nemorum) is one of the most formidable pests with which the British cultivator is acquainted. Although called a fly it is in reality a beetle, and is equally destructive, both as a grub and as a perfect insect. The remedies proposed for its destruction are simply innumerable, the plan which seems to be perfectly successful in one locality being useless ten miles off. As in many other instances, it seems better to use preventive measures against this insect than to wage hopeless war against it after it has once gained a footing. With regard to preventive measures the late Edward Newman writes:—"In the counties I have most frequently visited there are generally huge embankments thrown up after the manner of the earth-works of the ancient Britons. On one side there is often a deep trench, on the other side a broad strip of uncultivated land which is occupied by weeds. On the top of the embankment is an assemblage of Hazel, Oak, Maple, and Whitethorn, thickly interspersed with the dwarfed suckers of mutilated Elms. The whole of these fortifications are adorned with a rank and luxuriant crop of Charlock, Hedge Garlic, Docks, Thistles, Knobweed and Kecks. In such spots I have exercised my sweeping net, and found the Turnip Beetles in swarms. I would recommend reducing these embankments both in number and magnitude, and throwing the whole space into the field; when there was an absolute necessity for a fence, I would reduce it to the smallest possible dimensions, and would clear it of Charlock, Hedge Mustard, Docks, Thistles, and Kecks; instead of allowing these weeds to increase and multiply by the dispersion of their seed, I would gather them into heaps, and, watching my opportunity, actually fire them in the face of the enemy day after day in the brightest sunshine, now and then casting a pinch of sulphur into the smouldering, smoking mass. The gain of land would repay tenfold the required labour to harvest the weeds; the weeds themselves would be the only fuel required; and 5s. worth of sulphur would be enough for a good-sized farm."—With regard to smoking the fields, Mr. Newman observes:—"Experience having taught me that insects abominate smoke, and are killed by the fumes of sulphur, I endeavoured to bring this experience to bear on the Turnip Beetle, and found it most successful. Observing that the Beetles, when there was any breeze at all, came against the wind, I lighted a series of weed fires on the lee side of a Turnip field, and thus arrested the advance of the invading army. I believe most experimentalists would have lighted the fires to the windward of the Turnips, so that the smoke would be blown all over the field; but knowing the direction the enemy was taking, or would of necessity take, I thought it better to meet him outside the trenches, and thus render the field of battle, if I may so call it, offensive instead of inviting.

This strategy was followed until the Turnips were strong enough to resist the invader without any assistance of mine, and the crop was saved."

There are also two other favourite preventives which have proved effectual in some cases, but not in others. One is, to sow the seed in drills instead of broadcast; the other, to mix the seed with flowers of sulphur before sowing. Brushing the insects off the plants; sprinkling them with quick-lime or lime-water; burning the surface of the land are said to be effective. Trenching the ground deep is also resorted to; and strewing the ground thickly with gas-lime for three mornings after the seed is sown is also said to be effectual.—In small gardens a light frame stuck full of Alder branches, and drawn over the crop, will discompose the enemy; or a strip of cloth 6 in. wide, and well covered with bird-lime, may be used with great effect.—The following receipt may also be tried:—To 1 gallon of chamber-lye add 2 oz. of tincture of assafœtida. Soak the seed in this mixture twenty-four hours, and dry it in the shade. It is very necessary to attend strictly to the drying—the object being for the seed to absorb the liquor, which takes a considerable time if done properly in the shade; the sun's rays or drying winds proving fatal to this receipt. Care must also be taken to have the chamber-lye free from slops. The gallon mentioned in this receipt will prepare 16 lb. of seed.—A correspondent who states that he has been free from this plague for two years writes as follows:—In the district in which I farm Turnip culture is conducted invariably upon the ridge system; and the only means I use to secure a crop, in spite of the fly, is to supply it abundantly with its favourite food—the white Turnip. This I do by having a third canister fitted on the centre of my Turnip drill, and the seed intended for the fly—very fresh white seed—is deposited upon the ground between the crop-bearing ridges. It is covered up by the fine earth, which is displaced by the coulters, and, being slightly covered, vegetates earlier than the crop. Even when the crop consists of white Turnips it has been only slightly damaged, the extra quantity of food supplied to the insect having rendered its ravages comparatively harmless.

Varnishes.

Before any article is varnished it should be thoroughly cleansed from all grease spots with plenty of hot water, soap, and soda, which must be well washed off. It is also essential that the article to be operated upon should be perfectly dry.

The following is a good Varnish for rustic seats:—Boil 1 quart of boiled Linseed oil and 2 oz. of asphaltum over a slow fire till the asphaltum is dissolved, the mixture being kept stirred to prevent it boiling over. This gives a fine, dark Oak colour, is not sticky, and looks well for a year.—Or, first wash the furniture with soap and water, and when dry, on a sunny day, brush it over with common boiled Linseed oil; leave that to dry for a day or two, then varnish it over once or twice with hard Varnish. If well done this will last for years, and prevent annoyance from insects.—A common black Varnish for wood and iron may be made by mixing 1 gallon of coal-tar with ½ pint of spirits of turpentine and 2 oz. of oil of vitriol, stirring the mixture briskly until the ingredients are thoroughly incorporated.—A finer kind may be made by adding 4 oz. of asphaltum and 8 oz. of burnt umber to 1 gallon of boiled Linseed oil. Grind the umber smooth with a little of the oil, and add it to the asphaltum previously dissolved in a pint of the oil by heat, then add the remainder of the oil; boil, cool, and thin with turpentine to the proper consistency, or melt 2 lb. of asphaltum in an iron pot; add of hot boiled oil 1 pint, mix well, cool, and add 2 quarts of oil of turpentine.—A good Varnish for white wood is made by dissolving 3 lb. of bleached shellac in 1 gallon of methylated spirit; strain and add 1½ gallon more spirit. Fine, dry, warm weather should always be chosen for varnishing operations.

Vine Pests.

These invariably come from neglect. If the atmosphere of Vineries be kept in a clean and healthy state, and the ventilation attended to in a timely and proper manner, neither insects nor mildew will be troublesome; but neglect these precautions and one, if not both, will quickly be seen upon the Vines. Red spider and thrips luxuriate in a dry, close atmosphere, mildew in a close, damp one; but it is a rare thing for either to appear if the atmosphere of the house be kept pure and healthy. A healthy atmosphere can only be secured by the timely admission of air in the morning; indeed, the atmosphere of a forcing or plant house to be really healthy should have a constant ingress and egress of fresh air night and day, not necessarily a strong draught, but just sufficient to admit of a gentle circulation of fresh air. All good cultivators are cognizant of the importance of an arrangement of this kind, and for very early forcing special means will have to be adopted. The best and most durable arrangement for this purpose is to place opposite two or three of the ventilators (the number being governed by the size of the house) frames of the necessary width, and about 1 ft. deep, filled in with fine perforated zinc. Through this the heated air escapes very gently, but still sufficiently to allow of the necessary change of air. An atmosphere so regulated, with a sufficient degree of moisture, is the very opposite of what is required for the propagation of mildew or insect life. The remedies for the different insects that attack the Vine will be found under their respective headings.

Washes for Fruit Trees.

Insects and mildews injurious to the leaves of fruit tree seedlings and root grafts can be kept in subjection or destroyed by a free use of the following combination of lime and sulphur: Take of quick or unslaked lime four parts, and of common flowers of sulphur one part—break up the lime into small pieces, then mix the sulphur with it in an iron vessel, pour on them enough boiling water to slake the lime to a powder; cover in the vessel close as soon as the water is poured on. This makes also a most excellent whitewash for orchard trees, and is very useful as a preventive of blight on Pear trees, to cover the wounds in the form of a paste when cutting away diseased parts, also for coating the trees in April. It may be considered as the one specific for many noxious insects and mildew in the orchard and nursery; its materials should always be ready at hand; it should be used quite fresh, as it soon loses its potency. Wherever dusting with lime is spoken of this should be used. This preparation should be sprinkled over the young plant as soon as or before any trouble from aphides, thrips, or mildew occurs, early in the morning while the dew is on the trees. This lime and sulphur combination is destructive to these pests in this way, by giving off gaseous sulphurous compounds, which are deadly poison to minute life, both animal and fungoid; and the lime destroys by contact the same things, besides its presence is noxious to them; neither is it injurious to common vegetable life, except in excess. The above is recommended by a Commission of fruit growers, presided over by Professor Cyrus Thomas, State Entomologist of Illinois, and is part of a very full report embodying advice as to the best means and ways of fighting the insects that infest the orchards of that State.

—— The following receipt for a wash for orchard trees is used by Mr. William Saunders, of the Government Gardens at Washington:—Put ½ bushel of lime and 4 lb. of powdered sulphur into a tight barrel, slaking the lime with hot water, the mouth of the barrel being covered with a cloth; this is reduced to the consistency of ordinary whitewash, and at the time of application ½ oz. of carbolic acid is added to each gallon of the liquid. It is usually applied in the spring, but in the opinion of Mr. Saunders it would be more effective if applied later, but the great difficulty of such operation is the foliage on the tree. Apply to trunk; it will not hurt the branches or foliage if applied to them also.

—— An experienced fruit-grower, the owner of a fine orchard near Niagara River, Western New York, uses the following simple method with eminent success. He takes lye from wood ashes, mixes a little grease with it, heats quite warm, and, with a syringe, throws it up into all parts of the trees, branches, and trunk. It will effectually kill all kinds of caterpillars and worms that are either infesting the tree in nests or running over the bark. Trees treated in this manner were exceedingly healthy, beautiful, and vigorous in appearance, possessing a smooth, glossy bark, and bore the best Apples in the country. The remedy is easy and cheap. Common potash will do as well when wood ashes are not obtainable.

—— For Vines and Peach trees, wash them well with soap and water, and when they are dry paint them with 2 parts of flowers of sulphur, 2 parts of soil, 1 part of soft soap, and 2 parts of clay, reduced with water to the consistency of paint.

—— Old fruit walls that have become so full of nail-holes from long use that they harbour insects, should be washed with a mixture of Portland cement, lime, and bluestone, a good handful to 1 gallon, which will not only fill up the nail-holes to some extent, but will also help to eradicate the insects. The mixture can be made of a lighter or darker tint, according to taste, by adding to it a little more or less yellow ochre. The bluestone should be dissolved in 1 quart of the water and added to the mixture.

Wasps.

The depredations of Wasps are principally confined to their attacks upon ripe fruit. For some miles round the outskirts of large towns they never appear in such numbers as in purely country districts, where they are not so much molested. It is here that the ravages they commit are the most serious, with some fruits almost defying any means to preserve even a portion of the crop. The Green Gage Plum is a general favourite with them. Pears, Peaches, and Nectarines on the open walls suffer in like manner. Ripe Grapes are especially their favourites. Like the majority of other pests that attack garden produce, they are best nipped in the bud. On fine mild days in early spring the warmth of the sun brings the queens out, every Wasp at this season representing a colony, and every means possible should be employed to destroy all that make their appearance thus early. A small price upon their heads at this season offered to children will prevent the progeny of these queens from ever coming into existence. All nests that can be discovered should be destroyed. An offer of 6d. or 1s. each for the nests will be sufficient inducement to bring very great numbers of them in. Several methods are employed to destroy Wasps, of which the following are the most approved:—

Cyanide of Potassium.—Procure about ½ lb. of Cyanide ofr Potassium; dissolve this in boiling water sufficient to covee it, then have in readiness some cotton wool, and proceed to th nests; saturate a small portion of wool in the poison, and with a stick deposit it at the mouth of the hole, slightly pushing it inside—the entrance must be nearly stopped with the wool; in half-an-hour dig out the nests and destroy them thoroughly. Another way is to dissolve 2 oz. of Cyanide of Potassium in 1 pint of water, and pour the liquid into their nests at night. The solution is, of course, very poisonous, and should only be entrusted to a responsible person. As soon as the Cyanide is dissolved it should be put into a bottle, and be securely corked and labelled "Dangerous Poison."

Gas-tar.—A very good method of destroying their nests is, after dark, when the greater portion of the colony are at home, to thrust rags, dipped in gas-tar, into the nests, which should be freely ignited close up to the hole—not a Wasp will escape death. The nests may then be dug out, and the young grubs destroyed.

Netting.—Muslin or thin paper bags, in which to enclose Grapes, are often used; but there are several objections to both, especially in the autumn, for, if the bunches be not frequently examined, a few berries begin to mould, which quickly affect the whole bunch. The moving of the covering also destroys the bloom, so indispensable to the appearance of first-class fruit; and it frequently happens that, with all the care that can be given, the Wasps will find their way through the bags. By far the most effectual method to adopt is to keep them out of the house altogether. This can be done by the use of the hexagon garden netting, tacked over all the openings where air is admitted: this is sufficiently open to admit all the air required, without the Wasps being able to get through; even if the doors be required open, a large piece of the netting can be temporarily hung over the doorways in such a way as to exclude the Wasps.

Traps.—Traps may be made as follows:—Take a bell or hand-glass with a small hole in its top, elevate it on half-bricks, place some damaged fruit under it to allure the Wasps, then place on the top another glass, tight-fitting in every way; numbers of the insects will ascend through the hole in the top of the under glass into the upper one, from which they cannot find any exit and soon perish. A number of these traps placed upon the wall coping, as also on the ground at the foot of the trees, will be found effectual, not only for the Wasps, but also for the large bluebottle flies, which generally first attack Peaches, making incisions which are quickly taken advantage of by the Wasps. Mr. Gilbert, of Burghley, states that he saved a crop of Peaches by "taking" five hives of bees and putting the empty hives by the side of the Peach walls. In a few minutes they were, literally speaking, full, when he treated each hive to a little boiling water, killing the Wasps by thousands.

Treacle.—When they attack choice fruits, such as Peaches, Nectarines, and Apricots on the open walls, it is necessary not only to adopt means for their destruction, but such also as will attract them from the fruit they are devouring. Every tree bearing fruit on which they are busy at their work of destruction should have three or four wide-mouthed bottles hung in it half-filled with sweetened beer or treacle and water; this will attract them from the fruit, and they will also perish in large quantities.

Turpentine.—Another method is to take an ordinary beer or wine bottle, containing a small quantity of Spirits of Turpentine, and at nightfall, when the Wasps are quiet in the nest, thrust the neck of the bottle into the entrance and let it remain for a day or two. The fumes of the Turpentine will suffocate all the Wasps, and the nest may then be dug out and the grubs destroyed.

Waterproofing.

Boots.—Gardeners are, from the nature of their occupation, liable to suffer from damp feet, and hence the utility of "sabots," both in the hothouses and when standing about on the damp soil, as in nailing. Some authorities say that it is a bad plan to grease shoes for the purpose of keeping them soft, it rots the leather, and admits dampness more readily. It is better to make a varnish thus:—Put ½ lb. of shellac, broken into small pieces, in a quart bottle, cover it with methylated spirit, cork it tight, put it on a shelf in a warm place, and shake it well several times a day; then add a piece of camphor as large as a hen's egg; shake it again, and add 1 oz. of lampblack. If the methylated spirit be good, it will be all dissolved in three days, then shake and use, pouring out two or three teaspoonfuls in a saucer, and applying it with a small paintbrush, adding more spirit if it get too thick. If the materials be all good it will dry in about five minutes, and can be removed only by wearing it off, giving a gloss almost equal to patent leather. The advantage of this preparation over others is, that it does not strike into the leather and make it hard, but remains on the surface, and excludes the water perfectly. The same preparation is admirable for harness, and does not soil when touched, like lampblack preparations.

—— Another method is to put into an earthen pipkin ¼ lb. of bees'-wax, ½ pint of neatsfoot oil, 3 or 4 tablespoonfuls of lamp-black, and a piece of camphor as large as a hen's egg. Melt the ingredients over a slow fire, stir them thoroughly after they are melted, never heating it so hot as to make it boil. Make the leather warm, and warm the grease and put it on with a brush. It is not desirable to dry this in before the fire, but allow it to remain on the surface of the leather. A light coat of this kind will exclude the water even if the boots be exposed to the wet all day, and it will not injure leather by rendering it hard. When boots are exposed to wet wash them clean at night and hang them up where the leather will dry gradually, and put on a little of the above mixture every morning. It is far better to use a little often than to use it bountifully every ten or twelve days; the leather should not be allowed to become very dry before the mixture is applied.

—— A pint of boiled Linseed oil, ½ lb. of mutton suet, 6 oz. of clean bees'-wax, and 4 oz. of resin, are to be melted and well mixed over a fire. Of this while warm, but not hot enough to shrink the leather, with a brush lay on plentifully over new boots and shoes when quite dry and clean; the leather remains pliant. The New England fishermen preserve their boots water-tight by this method, which it is said has been in use among them above 100 years. They can thus stand in water hour after hour without inconvenience.

—— Before wearing your boots give the bottoms a good coating of tallow and tar and dry it in; then oil the uppers with castor oil—about one table-spoonful will be sufficient. The effect of castor oil is to soften the leather, while it fills the pores and prevents the water from entering —India-rubber in fragments, 1 oz.; boiled oil, 1 pint. Dissolve the rubber in the oil by heating them together very gently, and then add another pint of hot boiled oil, stirring the mixture well.

—— Boiled oil, 1 pint; bees'-wax and yellow resin, of each 2 oz.; melt them together.

The above, which should be applied warm before the fire, may be used for any kind of leatherwork as well as for boots and shoes.

Calico.—Waterproof calico for pits and frames may be made as follows:—Old pale Linseed oil, 3 pints; sugar of lead (acetate of lead), 1 oz.; white resin, 4 oz. Grind the acetate with a little of the oil, then add the rest and the resin. Incorporate thoroughly in a large iron pot over a gentle fire, and with a large brush apply hot to a fine calico stretched loosely previously, by means of tacks, upon the frame. On the following day it is fit for use, and may either be done over a second time, or tacked on tightly to remain.

Garments.—Waterproof clothes are so cheap that it is scarcely necessary to give a receipt for preparing them. The following, however, will be found a good method:—To waterproof any sort of cloth or made garments, all that is necessary is to make a very weak solution of glue or size (when cold it is weak and tremulous, about the consistency of calves' foot jelly), and while hot stir in a piece of alum until the taste of it can be distinctly perceived, when the piece is to be taken out, at the same time adding a little soap also, or rather soap-suds to it, and then, while it is hot, brush over the surface of the clothes with this solution.

Paper.—Dissolve 1¾ lb. of white soap in 1 quart of water; in another quart of water dissolve 1½ oz. of Gum Arabic and 5 oz. of glue. Mix the two solutions, warm them, and soak the paper in the liquid, and pass it between rollers. or simply hang it up to dry.

Weeds on Lawns.

It is often difficult to eradicate Plantains, Daisies, and other broad-leaved plants from lawns when once they have commenced to grow. Careful hand-picking in the case of small Grass plots is the safest remedy, but where the lawn is extensive, other means must be resorted to. If the lawn be large, set to work some women or boys, with a man to superintend. Let them cut off the Daisies by the root with an old knife. When this is done, cover the surface with from ¼ in. to ½ in. deep of soil and well-rotted manure mixed together in equal quantities. Spread this compost equally on the surface, after having gone over the lawn with an iron rake, drawing the latter backwards and forwards. As soon afterwards as there is a prospect of rain, sow in mixture for 1 acre Festuca duriuscula, 4 lb.; Festuca tenuifolia, 1½ lb.; Poa nemoralis, 1½ lb. (if shaded by trees, 1 lb. more); Cynosurus cristatus, 4 lb.; Trifolium repens, 3 lb.; and Trifolium minus, 2 lb.; and if the ground be liable to burn the Grass in summer, add 1 lb. of Lotus corniculatus. Sow on a dry day, rake over the ground lightly with a wooden rake, and roll well on the same day or before the seeds have germinated, taking care that the ground be dry. After sowing, let the lawn alone for a month, and then mow. Roll well throughout the summer, and go over the lawn with a spud, and grub up the Daisies by the roots. By pursuing this treatment we have known a lawn in which Daisies and Plantains were very plentiful become a good turf.

—— Take a three-pronged kitchen fork and thrust it into the Daisy root about 1 in. deep; strengthen your right hand by laying hold of the fork close to the prongs, and gently prise the Daisy up. When loosened, lay hold of the plant with the left hand and draw it out, keeping the points of the prongs as a guard against drawing soil out as well. The Daisy is now fairly got rid of for good. The operation should be practised while the ground is damp.

Salt.—The following treatment adopted by Mr. M'Knight, of Lydiard Manor, Wilts, effectually cleared a lawn containing 1½ acre of turf which was eaten up with Plantains:—A pinch of Salt is put into the crown of each Plantain in the hot dry summer time and left there slowly to deliquesce. If the salt remain visible for three days, the Plantains are done for effectually; if a shower of rain come on and melt the Salt before that time, it must be repeated. Mr. M'Knight found, in tracing out one fine old root, that the Salt, slowly melting, had destroyed leaf after leaf, and that the poison had been most fatally conducted, by the construction of the plant, to the centre of the root, and that it had then continued to soak into the root through its brown external case, until it had destroyed the very last particle of root, and left nothing but the hollow case or outside of the root, which was 9 in. long, and lay horizontally under the Grass. It took an old woman the whole summer to do one-quarter of the lawn, and required a great quantity of Salt. In some places there was no Grass, and after the Plantains were killed for some time I looked on large bare patches of mould; but the Grass soon came.

Sulphuric Acid.—Mr. Nichol, of Drinkstone Park, Bury St. Edmunds, who has been successful in clearing lawns of weeds by Sulphuric Acid, states:—Sulphuric Acid will, if properly applied, doubtless kill Daisies on lawns quite as effectually as it does Plantains. It would, however, of course be a more tedious job, particularly if the Daisies were large and many-headed. The acid should be dropped right in the heart of each plant, and a single drop will be sufficient; if the acid be good, it will immediately burn up the crown or growing point.

Watson's Lawn Sand.—This preparation, if used in the quantity prescribed, will kill Daisies and Plantains, and all other thick-leaved plants, and do no injury to the Grass. For small lawns it is specially fitted, but for large places the expense incurred in its use would be considerable. A pinch of agricultural salt put in the holes from which Daisies or Plantains have been cut out will kill the roots, and the Grass will soon cover the spaces again. Of course this can only be applicable to small lawns where Daisies and Plantains are not very numerous. This sand is a chemical preparation, which is said to possess the remarkable property of destroying Dandelions, Daisies, Clover, Plantains, and other Weeds, without injuring the Grass. We have had no experience of it ourselves, but the preparation is well recommended by testimonials. It may be used at any season of the year; but the most favourable time is from March till the end of September. Grass growing freely during that period, the vacant places caused by the decay of the Weeds are rapidly filled up, while the warmth of summer, especially if accompanied by moisture, greatly increases the Weed-destroying power of the Sand. Lawn Sand may be applied in various ways; the larger Weeds may be destroyed by placing about half a teaspoonful in the centre of each, when, if the weather be favourable, they will wither in a few hours, and in two or three days disappear. The Weeds may thus be speedily removed, but the Grass springing up more vigorously where the Sand has been placed, causes the lawn to assume an uneven appearance. The most satisfactory way of applying it, and the one recommended, is, to throw it broadcast on the Grass in small quantities at a time (not exceeding 1½ oz. or 2 oz. to the square yard); distributing it as evenly as possible, and repeating the operation every few days until the Weeds are entirely removed. It is quite possible, in this way, with a little perseverance, to remove almost every vestige of vegetation except the Grass itself, the general appearance of the lawn undergoing, at the same time, a gradual, but decided improvement. A careful application of Lawn Sand according to these instructions will be found a perfect remedy for Weeds on lawns; and if applied two or three times a year, will certainly prevent their recurrence.

Weeds on Walks.

Where garden walks have been properly made, and the Weeds never allowed to seed, hand-weeding after a shower of rain, and rolling directly the surface will bear the roller, are in many places practised with success. But in gardens where gravel walks are extensive, and, as sometimes happens, the gravel is of a coarse, shingly character, which, if disturbed or broken up, involves some difficulty in getting a firm, smooth surface again, a destructive agent of some kind becomes desirable. Almost everything that destroys the Weeds takes some of the bright red colour out of the gravel; but apart from such drawbacks, walks may be kept clean cheaply by the use either of salt or sulphuric or muriatic acids.

Arsenite of Soda.—Dissolve 1 lb. of powdered arsenic in 3 gallons of cold water, boil, and keep stirring; then add 7 gallons of cold water and 2 lb. of crushed soda; stir the whole well whilst boiling, and with a rosed watering-pot apply to the walks in dry weather, from March to May inclusive being the best time. The above quantity will be enough for 25 square yards. An inclining board should be placed at the sides of the walks or Grass to keep off the hot liquid.

Carbolic Acid.—A solution of carbolic acid, 1 oz. to a gallon of water, sprinkled over the path from a common watering-can, will effectually destroy the Weeds, and also kill ants and other small insects that may harbour there. If the walks have Box or Grass edgings, great care must be taken in applying the solution, lest the edgings suffer from its contact, as it is particularly destructive to any sort of vegetation.

Coal-tar.—Break up the path, rake off the largest Weeds, and then gather up some of the surface gravel and mix with Coal-tar to the consistency of mortar; spread this over your pathway an inch or two thick, cover this again with a sprinkling of clean gravel, then roll, and add another thin coating of gravel to finish off. No Weeds will grow in this, nor will there be any unpleasant smell or injury done to Grass edgings if the tar mixture be put a little thinner on the sides of the pathway.

Gas Liquor.—Ammoniacal liquor from the gas works will effectually destroy the Weeds. The liquor should stand at five or six Twaddell. It is said by some to be more effectual than salt.

Lime and Sulphur.—The following method of destroying Weeds on walks is pursued at the Mint in Paris, with good effect: 10 gallons water, 20 lb. quicklime, and 2 lb. flowers of sulphur are boiled in an iron vessel; after settling, the clear part is drawn off and used when needed. Care must be taken, for if it will destroy Weeds, it will just as certainly destroy edgings and border flowers if sprinkled on them. Weeds thus treated are said to disappear.

Muriatic Acid.—Mr. Temple, gardener at Packington Hall, Coventry, recommends diluted Muriatic Acid as a Weed killer. He states that it completely destroys all vegetable life (insect and animal as well) mixed at the rate of ½ pint to the gallon of water. One application of this will keep walks free from Weeds, Moss, or worm-casts for two years. As regards its application, it is only needful to wet the walk with it; in two seconds the Weeds and all insects will be killed, and in a few hours after they can be swept off; or if left, it does not matter much, for in a day or so they become shrivelled up, leaving the walks greatly improved in appearance, owing to the gloss it leaves on them. On broad walks, it should be put on with a large watering-pot and ordinary-sized rose. It is not necessary on hill walks to put it on so heavily that it will run; for, of course, wherever it touches Grass edgings or Box it at once kills them. Even in the case of narrow walks, however; if carefully used and run through a smaller rose no harm need be apprehended. As respects conditions, dry weather is better than wet for applying it, as it soaks in before it can be washed to the sides. Other authorities recommend a quart of acid to a gallon of water.

Oil of Vitriol.—Choose a clear evening after a hot day, put water into a wooden pail and add Oil of Vitriol thereto in the proportion of 1 to 30 parts of water. Take a well-painted watering-pot, and, beginning at the end of the path, step backwards, watering as you go, taking care to keep clear of the edgings, if Box, &c., and to avoid splashing the mixture over clothes and boots. When done, fill the pail with fresh water and leave the watering-pot in all night to soak out the acid. In the morning the path will not injure boots after the dew is off, and the Weeds will be either all dead or dying. Should one's clothes, &c., get a spot or two, a teaspoonful of smelling salts in water will restore the colour. Let the path remain for a day or two and then brush off the dead Weeds. One application is generally sufficient for a long time.

Mr. Hobday, writing to the "Field," states that he has found the use of acid more expensive than salt, and certainly not more efficient. It is also very destructive to water-pots, men's clothes, and in fact anything that comes in contact with it, therefore it requires to be used with great care. Whatever plan is adopted in destroying Weeds, the effect in any case will not last beyond one season. Both salt and sulphuric acid in moderate quantities, or when largely diluted, are powerful manures, and one good dressing in a year is sufficient when applied in dry weather. The remedy is much more expensive than hand-picking. What would cost £12 for hand weeding would amount to about £100 where the acid is used, to do the thing at all satisfactorily.

Salt.—Where a large extent of gravel walks and roads has to be kept free from Weeds, a good sprinkling of Salt sown over the surface in dry weather is the cheapest mode of doing it; but then its appearance is in some places objectionable. It remains like a miniature snowstorm glistening in the sunshine for some days, till all is dissolved and absorbed. Another way of applying it is in the shape of hot brine (about 1 lb. of Salt to a gallon of water), boiled in a cauldron on wheels and drawn off through a tap at the end into watering-pots, and sprinkled over the surface just sufficient to damp the whole face of the walk; but this plan is on the whole more expensive than simply sprinkling the dry Salt on the surface. True, it does not take so much Salt, but there is a considerable expense for fuel, and the labour in applying it is very much greater. But there is this advantage about it—it gets rid to a certain extent (not altogether) of the objectionable white appearance. Walks impregnated with Salt, if not well drained and well made, are nearly always damp in winter. Weeds generally may be completely extinguished by attending to the following directions:—1. Study their habits: without this you are working in the dark: you are shooting without taking aim, and are more likely to miss than to hit. 2. Have faith that Weeds can be killed. 3. Should you for the first year or two see little benefit from your labour, do not relax your efforts; you will certainly triumph in the end. This is the experience of all gardeners, and a firm conviction of this truth is one of the strongest incentives to perseverance. 4. Be beforehand with your work; this is exceedingly important. It is so not merely because Weed-plants can be killed easily just as they commence to grow, but it often happens that many Weeds actually go to seed before they get large enough to attract attention. If the gravel be of a kind that binds easily in a partially dry state, keep down Weeds by weeding when the walks are wet after rain, using the roller immediately after, but do not overload the walks with gravel. If the appearance of the walks be studied more than expense, and the gravel be coarse, aud not easily smoothed down when distributed over the surface, Salt may be sprinkled over it in the shape of hot brine. There is also another important consideration in connection with the use of salt or acids, and that is the difficulty in some cases of preserving the edgings from all contact with it. Where the edgings are turf we have never found any difficulty, but where Box edgings are used, the greatest care is necessary. If used near Box edgings, and showers follow soon after its use, in all probability unsightly patches of dead Box will not be uncommon.

Weevils.

These are principally leaf-eating insects, and are sometimes very troublesome, both in the grub state as well as when fully matured. They are, like many other unwanted company with which we have to contend, much more numerous in some localities than in others. The common brown Weevil attacks Vines just about the time the berries are set. They not only perforate the leaves in all directions, but also attack young berries, usually disfiguring the shoulders of a considerable number of the bunches. The mature insect is a night-feeder, and it may then be caught by placing a cloth under the plant it is feeding upon, and giving the plant a smart shaking, by which means the Weevils will fall off on to the cloth spread out to catch them, when they may be caught and destroyed. Something white, such as a large tablecloth or sheet, should be used, as, from its colour, it enables the Weevil to be seen the best.

Whitewash.

Slake half-a-bushel of unslaked lime with boiling water, keeping it covered during the process. Strain it, and add 1 peck of salt, dissolved in warm water, 3 lb. of ground Rice, put in boiling water and boil to a thin paste; ½ lb. powdered whiting, and 1 lb. of clear glue dissolved in warm water; mix these well together, and let the mixture stand for several days. Keep the wash thus prepared in a kettle or portable boiler, and when used put it on as hot as possible with either painters' or Whitewash brushes.

—— Mix 6 lb. of fine white pipe-clay in as much water as will make it as thick as paint; soak and dissolve ¼ lb. of good glue; add and mix well; then add ½ lb. of fat or dripping of any kind, put on the fire and boil a few minutes, and use while hot. The fat being boiled with the pipe clay forms a kind of insoluble soap, which, if used while hot, defies all kinds of weather.

—— Limewash is prepared by placing some freshly burned quicklime in a pail, and pouring on it sufficient water to cover it. Boiled Linseed oil should then be immediately added in the proportion of 1 pint to 1 gallon of the wash. For rough work any refuse fat may be used.

Wireworms.

Every kind of vegetable planted on newly broken-up pasture or old turf-land is sure to suffer from Wireworm (the larva of the Elater lineatus or Click Beetle) if not perseveringly dressed for the first two years with tolerably liberal dredgings of salt, at the rate of 6 cwt. to 8 cwt. per acre, when the weather is cloudy and rainy, and constant surface-stirring of the soil with hand-scarifying or methodical hoeing on fine dry days, no matter how often performed, in order to well intermix and incorporate the soil. The treatment described, however, will very soon eradicate the Wireworm, and wonderfully improve the growth and health of all kinds of garden vegetation. At the same time, if any part of the ground be pretty well covered with growing vegetation, and it be not convenient to sow or cast on the salt in a regular way evenly over the surface, sow over and amongst the crops broken-up or small pieces and dust of Linseed oilcake. This the Wireworms will eat, and then swell up and burst; but salt is the best remedy for effecting a permanent clearance. It will very soon do so if methodically applied, and will also improve the soil for a luxuriant vegetation for the future. As soon as any crop is cleared, apply a dredging of salt and fresh air-slaked hot lime; give the surface a deep scarifying; fork and tumble it up into rough ridges, in width according to the crop intended to be planted, and plant or sow half-way up the ridges on one or both sides, or on every other ridge, according to the desired distance, thus affording a convenience not only of observing the ravages of any stray Wireworm or grub, but exposing a good deal of the earth's surface to atmospheric influence; pulverize it afterwards, and hoe and scarify it down to a healthy state so as to torment the enemy. Nevertheless, the best way is, in taking into use or breaking up old pastures either for garden or farm, first to dredge the surface with salt previous to putting plough, fork, or spade into it, and folding sheep on it for two or three nights, applying a dredging of salt at the rate of 4 cwt. or 5 cwt. to the acre each day, evenly over it.

In gardens they are equally destructive, especially where there has been new soil added from Grass land. The Wireworm is not at all fastidious as to any particular description of food, being equally at home feeding on the roots of a choice Ranunculus, Pink, or Carnation, or in the kitchen garden on the more homely fare of Potatoes or Beet. In some parts it exists in much greater numbers than in others. In the south of the kingdom it is more plentiful than in the north. There is nothing that suffers more from its attacks than the Ranunculus. The Ranunculus grower should pass through the hand the whole of the new soil he yearly adds to his beds, breaking every piece that is sufficiently large to conceal any of these unwelcome visitors; and, after the soil is consigned to the beds, it is necessary to resort to the further precaution of inserting slices of Potatoes or Lettuce stems thickly 1 in. below the surface of the soil, looking over them every day. The same should be done when renewing the earth of any other plants, whether in the flower or kitchen garden. Birds of all kinds are excessively fond of them, and it is quite amusing to see the eagerness displayed by birds in an aviary to devour them; the birds lose all sense of timidity in their haste to obtain these delicious morsels. Alcohol, spirits of tar, nitrate of soda, and salt have been strongly recommended as specifics against their attacks; but the advocates of these remedies forget the cost and the difficulty of approaching them. It is easy for a chemist to say, "alcohol will destroy the Wireworm, therefore buy the alcohol and employ it;" but it is difficult to conceive an object more pitiable than a farmer who sets himself to utilize the advice. How is he to begin? Frequent plough-ing and harrowing exposes the Wireworms to birds, and rooks and starlings have been killed with hundreds of Wireworms in their crops; but avoid the supposed remedy of hard rolling, it only protects the Wireworms from the birds, and cannot crush them; they are as tough as pin wire.

Woodlice.

Woodlice (Oniscus asellus) are exceedingly troublesome when they exist in large quantities. Being almost omnivorous, nothing comes wrong for them. They seem to equally enjoy a juicy Peach or Melon, a fresh Mushroom, the roots of an Orchid, or the most putrid animal or vegetable matter, if in a sufficiently dry state Where they exist in large numbers in the Orchid-house they do great damage by eating the young feeding points of the roots, especially of such plants as Cattleyas, that require to be kept dry when not in active growth, but which, nevertheless, make a quantity of roots during that season. If the Woodlice be numerous at this time they will destroy almost every root that is made on the surface of the pots, rendering the growth which follows small and weak. The Woodlouse is not an insect, although it looks like one, but it crosses the border and belongs to the class of Crustaceans, of which lobsters and crabs are the most honoured members. Its proper function is that of a scavenger, but as the human scavenger sometimes exceeds his duty in sweeping up things which are not yet past use or which may be of value, so the Oniscus does not content itself with feeding on the detritus and decaying vegetable matters which are its proper business to consume, but, when it finds its way into a hot-house, takes a fancy to costly living plants, and occasionally does them a good deal of harm. In the open border they also attack herbaceous plants. It is no uncommon thing to see some of those which spread themselves over the ground and so furnish a fine shelter to insects, grow sickly, and, on examination, it will then be found that there is a crowd of young Onisci beneath, which have been eating the collar or neck of the plant just above the ground until they have nearly removed the outer ring, and so destroyed the plant. When they get into an Orchid house it is difficult to dislodge them, for they establish themselves among, and make galleries through, the Sphagnum in the baskets, or where the Orchids are growing. The gardener may be surprised at seeing his plants bitten and fading. He may turn over every bit of slate, tile, broken pot, wood, bark, or anything else that might serve as a hiding-place, and see nothing; but unless he watch during the night, and catch the culprits at work (for they are nocturnal animals), he will never find out that it is these Onisci that have done the mischief, and that their hiding-place is about the plant itself. There are several species—some grey, others nearly black, all paler beneath. Their life is longer than that of most insects, as they live, and seem to increase in size, for several years. They have the faculty of rolling themselves up like a Pea, in the same manner as the hedgehog, whence their French name "cloporte," as we should say "one who closes the port or door." No wholesale mode of destroying them is known. They must be cut off in detail, and the same sort of contrivances which are employed to entrap earwigs and surface larvæ must be used against them. In the Mushroom-house they are a very great nuisance, for here everything exists congenial to their taste—warmth, food, and material in which to lodge. If they exist in great numbers, boiling water poured down the sides of the beds up to the wall will destroy all with which it comes in contact. The little pots with the Potato baits can be used with advantage; but here, as with Melons, taking time by the forelock in destroying them, before they exist in numbers sufficient to do much harm, is the right way. They sometimes are a source of annoyance on the Peach-wall, by eating holes in the ripe fruit; it is not the quantity they eat, but the number of fruit they disfigure. Here they exist where the mortar in the joints is defective, and more especially under the coping, where they meet with suitable lodging. The best remedy is keeping the walls well pointed, so as not to allow them any place to secrete themselves; without this they cannot exist, for all the soft-billed birds, such as robins and hedge-sparrows, devour them eagerly if they can get at them.

Boiling Water.—Where frames are infested by Woodlice the most effectual remedy is to pour Boiling Water round the inside of the woodwork, care being taken not to touch the leaves or roots of the plants in the frames.

Cotton Wadding.—Where Orchids are attacked by Woodlice wrap little bits of Cotton Wadding round the roots, beginning a little way up the hard old portion, and finishing an inch or so below the tender green point. This plan is followed in Mr. Williams's collection at Holloway with the best results. The enemy does not pass the Cotton Wadding.

Horse-droppings.—They are extremely partial to Horse-droppings in a half-dry state; where they exist in quantities a number of 10-in. or 12-in. pots may be kept, filled with droppings, and placed amongst the plants, near the pipes, or wherever they congregate. If these be taken out and emptied once a week, the insects destroyed, and more droppings put in, they may be soon reduced in number, so as to be incapable of much harm.

Poisoned Parsnip.—Cut a Parsnip into small squares, get an old pot or saucepan to boil it in, mixing a small portion of arsenic; boil long enough to cook the Parsnip soft but not to break into pieces, then place them about the houses infested by Woodlice. They will soon attack the dainty morsel most ravenously, and pay the penalty with their lives, for they never return to their haunts. Great care should be exercised in the use of this remedy, as it is a most dangerous preparation, but most effectual for the destruction of Woodlice.

Potatoes.—Put a cold boiled or roasted Potato into a small flower-pot, cover the Potato with Moss, leaving a little hanging out of the pot by way of enticing the insects to enter; then lay the pot on its side in a corner of the frame. Woodlice feed in darkness, and at the approach of day they trot off to their hiding-places in cracks and crevices, or amongst the loose soil or bark; the Moss is therefore necessary to induce them to remain in the pot, to which they will flock in hundreds after having once tasted the Potato. Every morning the pots should be taken out of the pits and the insects destroyed. The same bait will serve for a week or longer. If properly attended to half-a-dozen pots so prepared will soon clear a frame of this troublesome pest.

Various.—If two or three tomtits be shut up in a conservatory for a few days, they will devour all the Woodlice without doing any injury to the plants.—If a toad or two be kept constantly in the house, they will devour a great number.—They may be kept from ascending standards and espalier trees by tying a piece of wool round the stems and the supporters.—Lay little heaps of Lettuce leaves in cool, quiet places, and examine them at dusk and daybreak. Catch and kill in any way you please; a pot of brine is a very good bath for the purpose.—Lay about also in the neighbourhood of choice subjects young Cabbage leaves slightly smeared over with rank butter or lard; catch and kill as before.—Lay about in cool quiet spots small heaps of fresh brewers' grains; catch and kill as before.—Where Woodlice abound, take some dirty flower-pots (always combine a little dirt of some sort with insect traps, for insects are extravagantly fond of dirt), and fill these dirty flower-pots with dry Moss and crocks mixed together. Place them where the pests abound, and cover each with a tuft of dry Moss. Every other day proceed to catch and kill in this simple manner:—Have a large pailful of boiling water; take up a pot quietly, and quickly shoot out its contents into the water. You clear away your enemies by thousands in this way; there is no trap to equal a dirty pot filled with dirty crocks, and dirty (but dry) Moss.—If there arise any peculiar difficulty, such as a choice plant being eaten nightly. and you cannot catch the marauder, take a slice of Apple, and surround it with dry Moss, in a flower-pot. Take also a slice of Potato, and use it in the same way. Place these two pots one on each side of your delicate subject, but at a distance of 6 in. or so, and at dusk and dawn turn out the contents of each pot quickly, and it will be a strange thing if the marauder be not bagged.—Sweet Apples or Potatoes, scooped hollow and placed upon the pots, will attract them; if these be looked over every day, considerable numbers of the insects will be found underneath.—Melon frames and pits are their favourite haunts, especially the latter, if the brick-work be out of order, affording them means to secrete themselves. In the winter, whilst the pits are empty, point up all defects in the mortar, lime-wash, and remove all old soil or other material in which they can find shelter; and, as soon as the young plants are started, commence placing traps for them at once—do not wait until they exist in large numbers. It is the delay in taking means for their destruction until the place is swarming with them that renders them capable of so much mischief.

Worms in Carrots.

Many remedies have been tried on this formidable pest with but little success. One grower has found McDougall's Disinfecting Powder and Sheep Dip very efficacious. The method of using the Dip is to dissolve a 6-lb. canister in about 40 gallons of water and moisten the ground with it before sowing, giving an extra watering to the drill where the seed is sown. The Powder may be scattered on the land in the proportion of 1 lb. to the square yard.

Worms in Pots.

The common Earthworm is apt to infest the balls of pot plants and spoil the soil; it also stops up the drainage-hole in the bottom of the pot, so that water cannot escape, and the soil becomes sour in consequence. The presence of Worms in a pot is indicated by the accumulation of their casts on the surface of the soil. When a pot is suspected of containing Worms, it should be tapped smartly with the hand; the Worms in alarm come to the surface, when they should be seized at once, otherwise they will quickly retreat to the centre of the ball, so soon as they feel the least touch. If they cannot be dislodged in this manner, the ball must be carefully removed from the pot and examined, but not broken. Should this also fail, then water the pots with water heated to 123° Fahrenheit, or with an infusion of Tobacco, Walnut leaves, or with liquid insecticide, or a solution of guano. This will send the Worms either to the surface or to the sides of the pot, when, by lifting out the ball, they may be caught and killed. If the pot be placed half-way in a vessel of water heated to 1 3° Fahrenheit, it will be found the surest way to send the Worms to the surface.

—— Lime-water is also a good remedy. Pour 2 gallons of water on 1 lb. of lime; stir well up, let the liquid stand forty-eight hours, and then, having stopped the holes in the pots with clay, deluge the soil with the clear lime-water only, and the Worms will come to the surface. Remove the clay from the pot-holes after six hours, taking care to make the drainage free.

Among miscellaneous remedies may be mentioned boiling water, paraffin oil, benzoline, and carbolic acid. A sprinkling of soot spread over the drainage, before putting any soil into the pot, will prevent Worms from coming up into the soil for some time; but this gradually loses its power, and does not destroy those which are in the soil when potting takes place. It is, therefore, a good plan to pick the Worms from the soil before using it; a little soot mixed with it will effectually get rid of those smaller ones which may have been overlooked. Soot is a valuable fertilizer, and may with advantage be used in soil for nearly every purpose. Care should be taken that the bottoms of pots are never placed in loose soil, or any other free matter through which Worms can penetrate, or your preventive measures and trouble will be of no avail; a firm bottom of coal-ashes is the best substance on which to set pots, as it resists all attempts to get through. Gravel has not the same influence, unless laid in the form of concrete. Strawberry plants in pots are often infested with Worms. It is next to impossible to keep them out of these; they generally find their way into the small pots when the runners are being rooted in them. A handful of ashes under each pot will prevent their access in a great measure, but runner pots are often plunged in the soil, and they can then get in from either top or bottom. As many as are visible will, of course, be thrown out at the time of shifting, and if any still remain, the application of lime-water is the best method of destroying them.

Worms on Lawns.

Worms on lawns are often troublesome, especially during wet weather. Their entire eradication is impossible; the only remedy, therefore, is to fight them continually. Sweep the lawn with a Birch or other rough broom, so as to disperse the casts, then strew the surface with common salt at the rate of 8 bushels to an acre, choosing a moist day for the operation. Less than 8 bushels would do good, and a bushel or two more would do no harm. This dressing not only banishes the Worms from the surface, but, when used in the quantities just indicated, it has a beneficial influence on the Grass. The salt may be dissolved in water and applied in a liquid state; but the labour and waste of time thus incurred are needlessly spent, as no better results are experienced by this method than when common dry salt is employed. Six bushels of salt and 6 or 8 of soot well mixed together, and applied either in a liquid or solid form to a lawn of, say, an acre in extent, is not only an invaluable safeguard against Worm-casts, but is also a good dressing for the Grass; even soot alone, applied at the rate of from 12 bushels to 16 bushels to the acre, is equally serviceable for both purposes. Air-slaked lime, used at the rate of from 20 bushels to 30 bushels to the acre, or mixed with soot, or salt, or both, also forms a good dressing, especially for Mossy lawns, and it likewise destroys Worms and grubs.

—— Another very effectual cure for Worms on lawns is first to apply salt in the proportion of about 6 cwt. per acre, and then water well with lime-water made by placing 12 lb. of fresh or unslaked lime in a hogshead, and pouring 30 gallons of water over it, stirring it well up, and allowing to stand forty-eight hours. The lawn is to be watered with the clear liquid by means of a rosed watering-pot during damp weather, giving a good soaking the evening succeeding the one upon which a good watering has been given. Ammoniacal liquor diluted with six times its volume of water will answer even better than the lime-water, but it has the disadvantage of making the lawn look brown for a time. Both act by bringing the Worms to the surface, whence they may be swept up and cleared away.

—— Where the Worms do not exist in large quantities, the lawn may be watered with the following solution:—Dissolve 1 oz. of corrosive sublimate in a little hot water, which mix with 40 gallons of pump water, and apply to the turf with a garden watering-can, choosing wet weather, when the Worms are near the surface. A writer in the "Field" has tried this remedy on a moderately-sized lawn, employing a man and a boy a whole day with this result, that there was scarcely a Worm-mound visible and the Grass was as green as in summer. The pests will appear above ground at once if a sufficiency of the mixture be applied.

—— Take up the turf and relay it on 1 in. of fine coal ashes; if the Grass be weakly, spread a thin coating of good fine soil on the ashes before laying the turf down. There will be no fear of the Grass burning in dry weather; the wet soil, which induces the Worms to make their appearance, will keep the ashes moist and cool. Thorough draining will also remedy the evil, but as the turf would sink over the drains, it would involve as much trouble as relaying.

—— Peewits are also recommended for keeping down Worms. They hardly ever cease eating whilst a Worm is to be seen; they must be driven in at night or the cats will come after them. In the daytime there is not much fear, for if puss comes too close they will call out loudly for help. When Worms are scarce, put near their water-trough a little chopped meat, or some bread-crumbs mixed with hot dripping; one wing must be kept clipped. In addition to their very active services, these birds would be very interesting and attractive pets for many years; they cost about 3s. 6d. each.

GLOSSARY OF MATERIALS.

ALBUMENIZED PAPER (see Photography).

ALCOHOL (see Methylated Spirits, Spirits of Wine).

ALOES.—A resinous substance of an intensely bitter taste, extracted from the leaves of different species of Aloë. It will always be best to use Barbadoes Aloes, which may be had in quantities at from 1s. 4d. to 1s. 8d. per lb. Cape Aloes may be obtained at 8d. per lb., but it is inferior to the other, and not cheaper in the end. [Synonym—*Bitter Aloes*].

ALUM.—The Alum of commerce is the double sulphate of ammonium and aluminium, and, in its crystallized state, a large quantity of combined water. About 2d. per lb.

AMMONIA (see Liquid Ammonia).

AMMONIA, Biphosphate of.—A salt of Ammonia used as a manure.

AMMONIA, Nitrate of.—Another salt of Ammonia used as a manure.

AMMONIA, Sulphate of.—A salt of Ammonia used as a manure.

AMMONIUM, Chloride of.—A salt of Ammonium obtained from the Ammoniacal liquor of the gasworks. About 1s. per lb. [Synonyms—*Hydrochlorate of Ammonia, Muriate of Ammonia, Sal Ammoniac.*]

AQUA FORTIS.—A powerfully corrosive liquid obtained by distilling a mixture of nitre and oil of vitriol at a moderate heat. It is a virulent poison, and will infallibly destroy any animal or vegetable substance with which it comes into contact. It may be purchased at any chemist's for about 1s. per lb. [Synonym—*Nitric Acid.*]

ARSENIC.—One of the oxides of the metal Arsenic. It has acid properties, and forms salts with the metals. It is a violent poison, and must be handled with great care, as it is not only poisonous to animals but to vegetables as well. [Synonyms—*White Arsenic, Arsenious Acid.*]

ARSENIOUS ACID (see Arsenic).

ASPHALTUM.—A bituminous substance chiefly obtained from the shores of the Dead Sea. Mineral pitch, the bitumen from which asphalte pavement is made, is a species of Asphaltum. [Synonyms—*Jew's Pitch, Mineral Pitch.*]

ASSAFŒTIDA.—A gummy substance which exudes from the transversely cut roots of the Narthex assafœtida, having a strong and disagreeable odour.

Baryta, Carbonate of.—A salt of Baryta having strongly poisonous properties. Watson's Lawn Sand is said to owe its efficacy to a large admixture of this salt.

Bees'-wax.—This substance is too well known to need description. White wax is made from ordinary yellow Bees'-wax by exposing thin slices to the action of the sun, wind, and rain.

Benzene, Benzine (Benzol).

Benzol.—A thin, volatile, inflammable, transparent liquid, obtained from coal-tar by distillation. It is used principally as a solvent for India-rubber and gutta-percha, also under the name of Benzine Collas, for taking grease-spots out of clothes. The light spirit sold for burning in lamps under the name of Benzoline, at about 3d. per pint, serves all the purposes of pure Benzol. [Synonyms—*Benzene, Benzine, Benzoline, Coal-tar Naphtha, Spirits of Tar.*]

Benzoline (see Benzol).

Bitter Aloes (see Aloes).

Bluestone.—This well-known salt is, roughly speaking, a combination of sulphuric acid and copper. It is a violent poison, and will stain any fabric upon which its solution may be dropped. It may be purchased at any oilman's for 6d. per lb. [Synonyms—*Blue Vitriol, Blue Copperas, Sulphate of Copper.*]

Blue Vitriol (see Bluestone).

Boiled Oil.—The resinifying or drying properties of oils are greatly increased by boiling them either alone or with litharge, sugar of lead, or white vitriol, when the product forms the Boiled Oil, or drying oil of commerce. Those best suited for the purpose are Linseed, Poppy, Walnut, and Rape-seed oils. The preparation of drying oils is a troublesome and dangerous process. It is much cheaper to buy them ready prepared. [Synonym—*Drying Oil.*]

Borax.—Chemically speaking, Borax is a salt composed of two proportions of boracic acid and one of soda. It may be bought at any drysalter's for about 1s. per lb. [Synonyms—*Borate of Soda, Biborate of Soda.*]

Brimstone (see Sulphur).

Brunswick Green.—An impure carbonate of copper, mixed with more or less chalk or china clay; used as a green pigment by house painters.

Burgundy Pitch.—An impure resin obtained from the turpentine of the Abies excelsa. True Burgundy Pitch is difficult to obtain, the ordinary quality being made up of yellow resin, Linseed oil, and Palm oil.

Burnt Umber.—An earthy, brown pigment possessed of good covering properties.

Camphor.—A white, semi-crystalline, bitter, volatile solid, obtained from the Camphor Laurel tree (Camphora officinarum) of Japan and China. Being volatile, it should be kept in closely stoppered bottles; the Camphor in seed chests or insect cases requires renewing from time to time. Camphor is soluble in spirits of wine, forming camphorated spirit. Camphor costs about 2s. per lb. at the drysalter's.

CAMPHORATED SPIRITS (see Camphor).

CARBOLIC ACID.—One of the many products of the distillation of coal. It is much used as a disinfectant, its greatest objection it that it is poisonous; it is also used as an insectifuge. Crude Carbolic Acid may be obtained from the drysalter's at about 1s. per lb. [Synonym—*Phenic Acid.*]

CASTOR OIL (see Oils).—A fixed oil, obtained by expression from the seeds of the Ricinus communis. Price about 2s. per lb. at any chemist's.

CAUSTIC SODA.—Chemically speaking, Caustic Soda is the hydrated oxide of sodium. It is a powerfully caustic, greyish-white solid, which if exposed to the air rapidly absorbs water and becomes liquid. It is a most powerful poison, and if allowed to fall on the bare skin is apt to produce painful sores. It will corrode any vegetable or animal matter with which it comes into contact. About 1s. per lb.

CHALK.—Chemically speaking, Chalk is carbonate of lime. When finely levigated and dried in cakes it forms ordinary whiting or whitening. [Synonyms—*Spanish White, Whitening, Whiting.*]

CHINA CLAY (see Photography).

CHLORALUM.—A solution of impure chloride of aluminium, much used as a disinfectant. Besides being an efficient deodorizer and disinfectant, it has the advantage of being inodorous and non-poisonous. It may be purchased in 1s. bottles at any chemist's.

COAL-TAR.—One of the many products obtained during the distillation of bituminous Coal in the process of gas-making. It is too well known to need description. [Synonyms—*Gas Tar, Mineral Tar.*]

COAL-TAR NAPHTHA (see Benzol).

COLLODION.—Gun-cotton dissolved in a mixture of ether and alcohol forms the Collodion of the photographer and pharmaceutist. Pharmaceutical Collodion, being thicker, is more useful to the gardener than that used in photography. It may be bought at any chemist's for from 6d. to 1s. per oz. The bottle should be kept closely stoppered, or it will become too thick for use, and as the vapour is very inflammable it should not be used at candle-light. It acts by covering the wound to which it is applied with a thin, impervious film of gum-cotton.

COPPERAS (see Bluestone, Green Copperas, White Copperas).—Green Copperas, or Green Vitriol is sulphate of iron; Blue Copperas, Bluestone, or Blue Vitriol is sulphate of copper; and White Copperas is sulphate of zinc.

Copper, Sulphate of (see Bluestone).

Corrosive Sublimate (Bichloride of Mercury).—A terrible poison, it is the only thing, however, which will keep insects out of herbaria. It is soluble in cold water, in the proportion of 1 to 16. Price about 6d. per oz. at any chemist's. [Synonym—*Bichloride of Mercury.*]

Creasote (see Carbolic Acid).—A light liquid, obtained from wood-tar by distillation, and closely resembling carbolic acid, a solution of which will serve all the purposes for which Creasote has been recommended. It is also spelt Creosote, Kreasote, and Kreosote. Carbolic acid is much cheaper than Creasote, and serves every purpose.

Creosote (see Creasote).

Distilled Water (see Photography).

Essential Oils.—Volatile oils found in plants, and conferring upon their flowers, leaves, fruit, seeds, roots, bark, wood, &c., their peculiar and characteristic odour. As they are only used in small quantities they may be obtained at the retail chemists as they are wanted. [Synonyms—*Volatile Oils, Essences.*]

Flowers of Sulphur (see Sulphur).

Gas Liquor.—An impure solution of the sulphides of ammonium obtained as a by-product in the manufacture of gas. Its value as a manure depends on the amount of sulphate of ammonia which it contains.

Gas-tar (see Coal-tar).

Gentian Root.—The root of the Gentiana lutea contains an intense bitter principle, which renders it peculiarly valuable as a tonic, An infusion of the root is used for soaking seeds, in order to ward off the attacks of mice and birds. Costs about 1s. per lb. at any chemist's.

Glue.—The best Glue is prepared from the parings and waste pieces of hides and skins of oxen and cows. When clarified and bleached Glue forms the gelatine of the shops. Good Glue is transparent, and nearly tasteless and odourless.

Gold, Chloride of (see Photography).

Green Copperas or **Green Vitriol.**—Impure sulphate of iron used in making ink, and as a disinfectant. It may be bought at any oilman's for about 1d. per lb.

Guano.—This manure, which is so much used by gardeners, consists of the excrements of certain sea-birds which have accumulated on the barren and uninhabited islands and rocks on the western coasts of South America and Africa. Pure guano is seldom to be met with in a pure and unadulterated state in the market, being frequently adulterated with sand and sea-weed. Care should therefore be taken to procure this useful manure from a trustworthy house.

Gum Ammoniac.—A gum resin, consisting of the hardened exudations of the Dorema ammoniacum. Used as an ingredient in glass cements. Price 1s. 6d. to 2s. per lb.

Gum Arabic.—This Gum is too well known to need description. It exudes from the bark of several species of Acacia, hence it is frequently called by that name. The best white Gum is the most economical in the end. Powdered Gum should always be avoided, as it is generally adulterated with flour or starch. British Gum, or Dextrine, is torrefied starch. It is a cheap and poor substitute for Gum Arabic. The price of Gum Arabic varies from 8d. to 3s. per lb., according to colour and quality.

Gum Galbanum.—A gum resin of uncertain origin used in making glass cements. Price about 3s. per lb.

Gum Mastic.—A gum resin obtained from the Pistacia Lentiscus, much used in making varnishes and cements. Price 5s. to 10s. per lb., according to quality.

Gum Shellac (see Shellac).

Gum Tragacanth.—A gum which exudes from various species of Astragalus, used for mixing with Gum Arabic to increase its adhesive properties. About 4d. to 6d. per oz. [Synonym—*Gum Dragon.*]

Gypsum (Unburnt Plaster of Paris).—Gypsum is a hydrated sulphate of lime from which the water may be expelled at a red heat. When once more brought into contact with water it seizes hold of that fluid with such avidity that the whole mass becomes solid.

Hellebore.—The insecticide Hellebore is the powdered rhizome of the Veratrum album or viridum, and has nothing to do with the true Hellebore (Helleborus niger or the Christmas Rose). It acts as a powerful poison on insects, and for this purpose it should be used freshly ground, as it is apt to lose its virtue by keeping. About 6d. per lb.

Hydrochloric Acid (see Spirits of Salts).

India-rubber.—The concrete juice of the Ficus elastica and several other tropical plants growing in both hemispheres. It is used in making marine glue, for which purpose the pure rubber must be employed, vulcanized rubber being insoluble. The pure rubber may be purchased at about 1s. per lb. [Synonym—*Caoutchouc.*]

Iron Filings.—These may be obtained at almost any workshop. Great care should be taken that they are freshly made, otherwise they are most likely to be covered with a film of oxide, which will render them useless. They should be procured fresh and fresh as they are wanted.

IRON, Sulphate of (see Green Vitriol).

ISINGLASS.—Isinglass is the purest natural gelatine known; the finest kinds of Isinglass are obtained by opening, folding, cleaning, and drying the swimming bladders of various species of sturgeon. Isinglass is much adulterated with gelatine. It ought to be perfectly white and odourless, and almost entirely soluble in boiling water. Varies in price, from 6s. to 20s. per lb.

IVORY BLACK.—A very rich and beautiful black pigment made by roasting scraps of ivory in crucibles. It covers better than almost any other black pigment. About 8d. per lb.

KAOLIN (see China Clay).

KEROSENE OIL.—The American name for a certain description of petroleum. Ordinary petroleum or paraffin oil may be substituted for it wherever it is ordered.

KREASOTE or KREOSOTE (see Creasote).

LAMP-BLACK.—A black frequently made by burning coal-tar, bone oil, resin, and other carbonaceous bodies in close chambers, upon the walls of which the smoke is deposited in the form of fine soot. About 3d. per lb.

LIME.—This material is too well known to need any description. When a small quantity of water is thrown on it it is absorbed so rapidly that heat is given off, and the Lime falls to powder, losing a portion of its causticity. In this state it is said to be slacked or slaked. Mixed into a thin cream with water it forms milk of Lime. Cold water dissolves more Lime than hot. In making Lime-water, therefore, cold water should be used. Freshly burned Lime should be kept from contact with the air, otherwise it will become air-slaked.

LIME, Chloride of.—A mixture of various salts, formed by passing a current of chlorine gas over freshly-slaked Lime. It is a powerful disinfectant, and bleaches vegetable colours. It is a powerful and corrosive poison. About 6d. per lb.

LIME, Sulphate of (see Plaster of Paris).

LINSEED OIL.—A fixed oil obtained by expression from the seed of Linum usitatissimum, much used for varnishes, paints, &c. About 8d. per pint.

LIQUID AMMONIA.—The common name for what should be called Liquor ammoniæ or Liquid of Ammonia—Liquid Ammonia being a liquid obtained from ammoniacal gas by cold and pressure. It is made by passing ammoniacal gas into iced water. It may be obtained at any chemist's for about 1s. per lb. [Synonyms—*Liquor Ammoniæ, Ammonia, Liquor of Ammonia.*]

LIQUOR AMMONIÆ or LIQUOR OF AMMONIA (see Liquid Ammonia).

LITHARGE.—Impure oxide of lead, used in making drying oils. About 4d. per lb.

LIVER OF SULPHUR.—A mixture of several combinations of sulphur and Potassium (the metallic base of potash) formed when potash, sulphur, and water are boiled together. [Synonyms—*Sulphide of Potassium, Sulphuret of Potash.*]

MARINE ACID (see Spirits of Salts).

MERCURY, Bichloride of (see Corrosive Sublimate).

METHYLATED SPIRIT.—Spirits of wine, to which one-tenth of its volume of imperfectly purified wood naphtha has been added to prevent its being used as a beverage. Being sold duty free, it is much cheaper than ordinary spirits of wine. It may be purchased at the oilman's for about 5s. per gallon.

MINERAL PITCH (see Asphaltum).

MINERAL TAR (see Coal-tar).

MURIATIC ACID (see Spirits of Salt).

NITRE (see Saltpetre).

NITRIC ACID (see Aqua fortis).

NUX VOMICA.—The seed of the Strychnos nux vomica, containing the alkaloid strychnine or strychnia, one of the most fearful poisons known to the chemist. About 1s. 6d. per lb.

OIL OF ANISEED (see Essential Oils).

OIL OF CLOVES (see Essential Oils).

OIL OF LAVENDER (see Essential Oils).

OIL OF RHODIUM (see Essential Oils).

OIL OF VITRIOL.—A powerfully corrosive oily liquid, formerly obtained by distillation from green Vitriol, hence its popular name. It is now made directly from sulphur by a process too long for description here. Price about 2d. per lb. [Synonyms—*Vitriol, Sulphuric Acid.*]

OILS may be divided into three classes:—Essential or volatile Oils, such as Oil of Lavender and Oil of Cloves; fixed Oils which are non-volatile, such as Linseed and Castor Oils; and mineral Oils, such as Petroleum and Paraffin Oils. Some of the fixed Oils absorb oxygen and become solid, but do not evaporate. It is only the fixed Oils that really deserve the name. (See Essential Oils, Drying Oils).

ORRIS-ROOT.—The sweet-scented root of the Iris florentina, used for perfuming violet powder, sachets, &c.

OSIER BARK.—This substance owes its properties as an insecticide to a bitter principle called salicine.

Paraffin.—A semi-transparent, white solid, obtained from crude petroleum or paraffin oil. The latter substance is often popularly but erroneously called paraffin. Wherever paraffin is mentioned in the foregoing receipts the solid substance is meant. An ordinary paraffin candle serves for most purposes for which paraffin is required.

Paraffin Oil.—A volatile, inflammable liquid, obtained by distillation from Boghead coal, and much used for burning in lamps. As an insecticide it must be used with care, being poisonous to delicate plants. Petroleum answers all the purpose, and is cheaper.

Paris Green.—This poisonous pigment is a compound of arsenic and copper, and is identical with Scheele's Green. It consists of oxide of copper 28·51, and of arsenious acid 71·46 per cent., thus being a most virulent poison. The handling of dry Paris Green, especially by persons unaccustomed to its use, is attended with considerable risk and often followed by serious consequences. All packages, whether large or small, should be plainly marked "Poison." There is great danger in the mixing of this Green for Potato beetle, owing to the fine dust which arises in the process, which is inhaled, and also rapidly absorbed by the pores of the skin, especially if the person using it should be in a state of perspiration. To guard against this the hands and face (particularly the nostrils) should be protected as much as possible, and should be carefully washed after working with it, or with any of the preparations of which it is an ingredient. As it penetrates and poisons wood, gets into the seams and crevices of articles made of metal, and even into earthenware that is at all porous, all household utensils, or anything in barn or stable (to which cattle or horses could have access) in which the article may have been mixed, or from which it has been used, should be carefully set aside, and never again used for any other purpose. Malignant sores are not unfrequently caused by scratching the skin when itching or irritated from handling the Green. It should be constantly borne in mind that it is a more dangerous and deadly poison than arsenic, and planters and others, when purchasing, should be duly cautioned to exercise the utmost care in using it. [Synonym—*Scheele's Green.*]

Paris, Plaster of (see Plaster of Paris).

Pearlash (see Potash).

Petroleum.—A volatile inflammable liquid, obtained by distilling the crude Petroleum from the oil-wells of Pennsylvania and other similar substances obtained in different parts of the world. It is poisonous to insects, also to delicate plants; it must, therefore, be used with care.

Phenic Acid (see Carbolic Acid).

Phosphorus.—A white, waxy-looking solid obtained from bones. As Phosphorus is highly inflammable and extremely poisonous, the preparations containing it should be bought ready prepared. In handling Phosphorus paste care should be taken to avoid any of it getting into cuts or scratches, or troublesome sores will be the result.

PHOTOGRAPHIC CHEMICALS and MATERIALS.—These are best obtained from a dealer in photographic materials, as ordinary chemists generally charge higher prices. Nitrate of silver, 4s. per oz.; distilled water, 6d. per gallon; hyposulphite of soda, 1s. per lb.; acetate of soda, 2d. per oz.; chloride of gold. 1s. 10d. per 15 grains; kaolin, 4d. per lb.; white wax, 3d. per oz. Pressure frames, baths, dishes, and other apparatus vary in price according to size.

PIPE-CLAY.—Common clay, well dried, powdered, and sifted, answers nearly all the purposes of Pipe-clay.

PLASTER OF PARIS.—Burnt gypsum, or native sulphate of lime. Gypsum contains a certain quantity of water chemically combined with it, which is driven off by heat. The affinity of the burnt gypsum for water is so great, that it combines with it greedily, forming a dry and solid mass.

POKE ROOT.—The root of the Phytolacca decandra, used, in America, as an insecticide. It is now commonly grown in our gardens as an ornamental plant.

PORTLAND CEMENT.—A species of mortar, made by calcining a mixture of limestone and clayey earth. It is characterised by absorbing a large quantity of water, and acquiring, after a time, considerable hardness. It should be kept well protected from the air and damp.

POTASH.—A corrosive deliquescent salt, consisting principally of Carbonate of Potash, obtained from wood-ashes by lixiviation and evaporation (see Carbonate of Potash, Pearlash). Price, 4d. to 6d. per lb., at any oilman's. [Synonyms—*Carbonate of Potash, Pearlash.*]

POTASH, Carbonate of (see Potash).

POTASH, Nitrate of (see Saltpetre).

POTASH, Permanganate of.—A salt of Potash, which, when dissolved in water, forms Condy's Disinfecting Fluid. It is a valuable disinfectant. It may be purchased at the chemist's for about 6d. per oz.

POTASH, Yellow Prussiate of.—A beautiful yellow salt, containing prussic acid. It requires great care in using it, as it is extremely poisonous. It may be purchased at any chemists for about 3d. per oz. [Synonym—*Ferrocyanide of Potassium.*]

POTASSIUM, Cyanide of.—A powerfully poisonous salt, closely resembling fine white sugar. It gives off fumes of prussic acid by spontaneous decomposition, and should always be kept under lock and key. Costs about 3d. per oz. at any chemist's.

POTASSIUM, Sulphide of (see Liver of Sulphur).

QUASSIA.—The wood of the Picrasma excelsa contains a bitter principle, which renders its solution valuable for soaking seeds which are liable to the attacks of birds or mice.

RECTIFIED SPIRITS (see Methylated Spirits, Spirits of Wine).

RED LEAD.—A bright red pigment possessed of powerful covering properties. It is a virulent poison. About 8d. per lb.

RED OCHRE.—An earthy pigment much used as a common red paint. About 2d. per lb.

RESIN.—A dark, semi-transparent, brittle, substance which remains after the distillation of turpentine. Used as an ingredient in varnishes. About 4d. per lb. [Synonym—*Resin.*]

ROSIN (see Resin).

SAL AMMONIAC.—A salt of ammonium possessed of powerful fertilizing properties. It is generally obtained from gas liquor. Soot owes its fertilizing properties to this salt. [Synonyms—*Muriate of Ammonia, Chloride of Ammonium.*]

SALT.—The price of salt varies in different parts of the country from 5s. per cwt. to three times that amount.

SALTPETRE.—This salt is produced naturally on the surface of the soil by the action of the atmosphere in various parts of the world, especially the East Indies. When purified by crystallization it forms the nitre or nitrate of potash of the chemist. About 8d. per lb. [Synonyms—*Nitre, Nitrate of Potash.*]

SEAL OIL.—An oil obtained from the blubber of different species of seal. It should be clear and almost free from smell and colour.

SCHEELE'S GREEN (see Paris Green).

SHELLAC.—A resinous substance produced upon the young branches of several tropical trees by the puncture of a small insect called Coccus lacca or ficus. It may be obtained of several qualities, varying from dark to light, the palest being known as the best Orange Lac. [Synonym—*Gum Shellac.*]

SILVER, Nitrate of (see Photography).

SODA.—By "soda" is generally meant ordinary washing Soda, which is Carbonate of Soda with a large amount of combined water. Good Scotch Soda may be obtained from any oilman's at from 6s. to 10s. per cwt.

SODA, Caustic (see Caustic Soda).

SODA, Acetate of (see Photography).

SODA, Biborate of (see Borax).

SODA, Borate of (see Borax).

SODA, Carbonate of (see Soda).

SODA, Hyposulphite of (see Photography).

SODA, Nitrate of.—A powerful manure, the fertilizing properties of which are due to the nitrogen which it contains. [Synonym—*Cubic Nitre.*]

SOFT SOAP.—A powerful detergent made from oil or grease and potash—Hard Soap being made from Soda.

SOOT.—This well-known substance owes its fertilizing properties to its containing a certain amount of sal ammoniac.

SPANISH WHITE (see Chalk.)

SPIRITS OF SALT.—A corrosive liquid formed by passing hydrochloric acid gas (produced by the action of oil of vitriol on common salt) through cold water. It may be purchased at any manufacturing chemist's at from 1d. to 3d. per lb., according to locality. [Synonyms—*Hydrochloric Acid, Muriatic Acid, Marine Acid.*]

SPIRITS OF TAR (see Benzol).

SPIRITS OF TURPENTINE.—A light, volatile, inflammable spirit distilled from turpentine, the residue being ordinary resin or rosin. [Synonyms—*Turps, Turpentine.*]

SPIRITS OF WINE (see Alcohol, Methylated Spirit).

SUBLIMATE, CORROSIVE (see Corrosive Sublimate).

SUGAR OF LEAD.—A crystalline salt, obtained by acting on metallic lead with the fumes of vinegar. It is used as a drier in making drying oil. Price 1s. per lb. at the drysalter's. [Synonym—*Acetate of Lead.*]

SULPHUR.—This well-known substance occurs in two forms:—First, in cylindrical sticks as roll Sulphur or brimstone; and secondly, as sublimed sulphur or flowers of sulphur. Brimstone costs about 2d. per lb.; flowers of sulphur, 8d. per lb.

SULPHURIC ACID (see Oil of Vitriol).

SWEET OIL.—This term is generally applied to Linseed, Olive, or Almond oil, either of which will serve the same purpose.

TALLOW.—This substance is too well known to need description. A composite candle should never be used to replace it, as it contains a strong acid.

TARTAR EMETIC.—A chemical compound of tartaric acid, potassium, and antimony. It is a violent poison, and requires caution in use.

TRAIN OIL.—A strong smelling oil, obtained from the blubber of the whale. [Synonym—*Whale Oil.*]

TURPENTINE (see Spirits of Turpentine).

VERDIGRIS.—A green pigment, obtained by acting on metallic copper with nitric acid. It is a virulent poison. About 2s. per lb.

VITRIOL (see Oil of Vitriol, also Blue, Green, and White Vitriol).

WAX (see Bees'-wax).

WHITE ARSENIC (see Arsenic).

WHITE COPPERAS (Sulphate of Zinc).—A powerful poison in large doses, and a valuable emetic in small ones. About 1s. per lb.

WHITE LEAD.—A beautiful white pigment, formed by acting on metallic lead with the fumes of decaying horse-manure. About 8d. per lb.

WHITE WAX (see Bees'-wax).

WHITENING or WHITING (see Chalk).

WOOD ASHES (see Potash).

WOOD NAPHTHA or WOOD SPIRIT (see Methylated Spirit).

ZINC, Sulphate of (see White Copperas).

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